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SSR: Solar System Simulator

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Overview

Solar System Simulation SSR[1]. Android globus coelestis (celestial globe) and interactive calendar with Zodiac signs and timepiece covering the Solar System in the entire observable universe up to $r = 14.25\ Gpc$.

Contains $n = 69$ stars, $n = 70$ nebulae and star clusters, most important Milky Way objects, $n = 48$ galaxies and galaxy clusters as well as the most well-known quasars. Full implementation of all $n = 110$ Messier objects (Messier, 1784), Inner Cloud (Hills, 1981), Oort Cloud (Oort, 1950) and more.

Further astronomical objects can be implemented by means of external definition files. All objects of the Caldwell catalogue (Moore & Pepin, 1995) as well as parts of the Herschel 400 catalogue (Mullaney, 1976) are included as *ssr_Caldwell.dat* and *ssr_Herschel400.dat*. For additional important astronomical catalogues see e.g. *CN* (Herschel, 1786) or *NGC* (Dreyer, 1888).

Solar System parameters of the Sun, planets and Moon are based on the current NASA Planetary Fact Sheets (Williams, 2023). Positions, distances and sizes of further objects are from Wikipedia sources (Wikipedia contributors, 2023), which can be traced back primarily to the *SIMBAD* astronomical database (Strasbourg astronomical Data Center, 2023), the *VizieR* Catalogue Service (see Ochsenbein et al., 2000) or the NASA/IPAC Extragalactic Database *NED*.

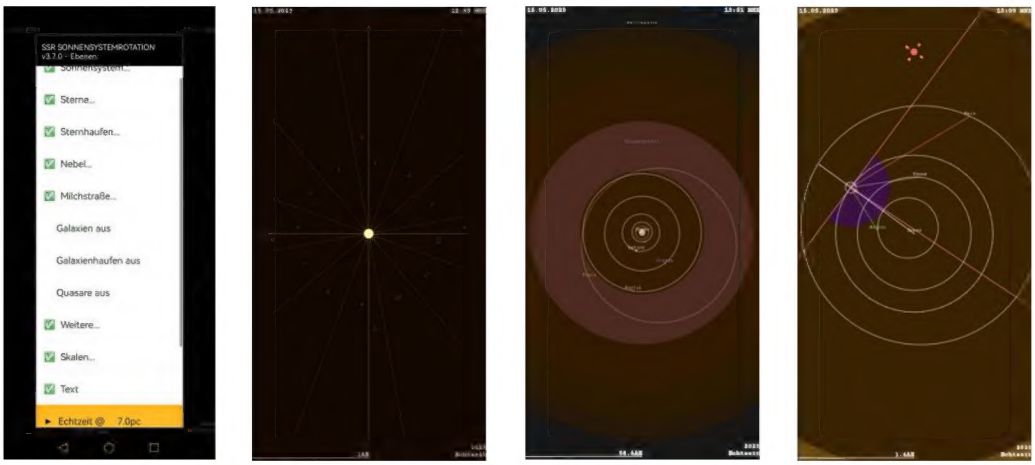

Figure 1. The Sun at $r = 0.1\ au$ astronomical units; Solar System with Asteroid and Kuiper Belts as well as Heliosphere at $r = 58.6\ au$; Inner Solar System with orbits, current rotation position of the Earth with time and position representation, as well as projection lines to the neighboring planets at $r = 1.4\ au$.

[1] https://doi.org/10.5281/zenodo.8240203

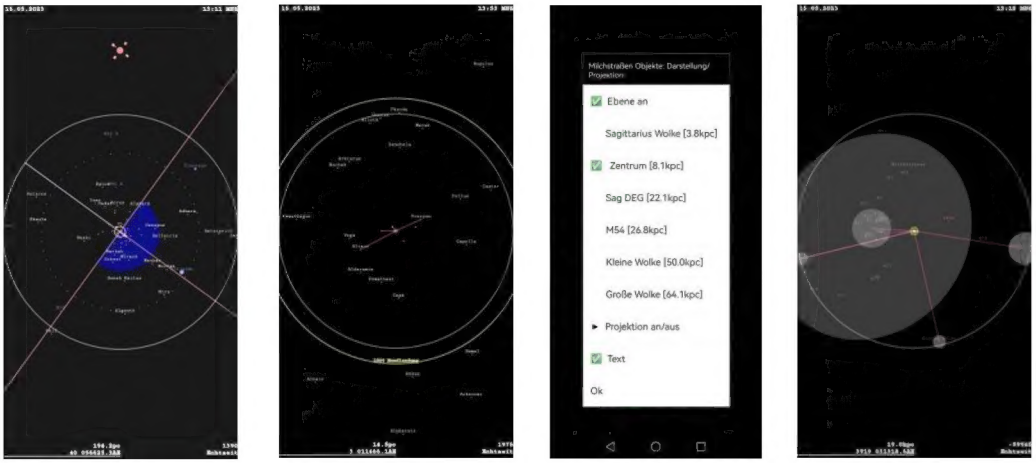

Figure 2. Surrounding stars at $r = 194.2\ pc$ and their relative positions to Earth, artificial horizon facing south; closer stars with their relative historical position and representation, from $r = 14.5\ pc$ before the year 1976; the Milky Way at $r = 19\ kpc$ with Magellanic Clouds, Sagittarius Dwarf Elliptical Galaxy Sag DEG (Ibata et al., 1994) and V838 Monocerotis (Brown et al., 2002).

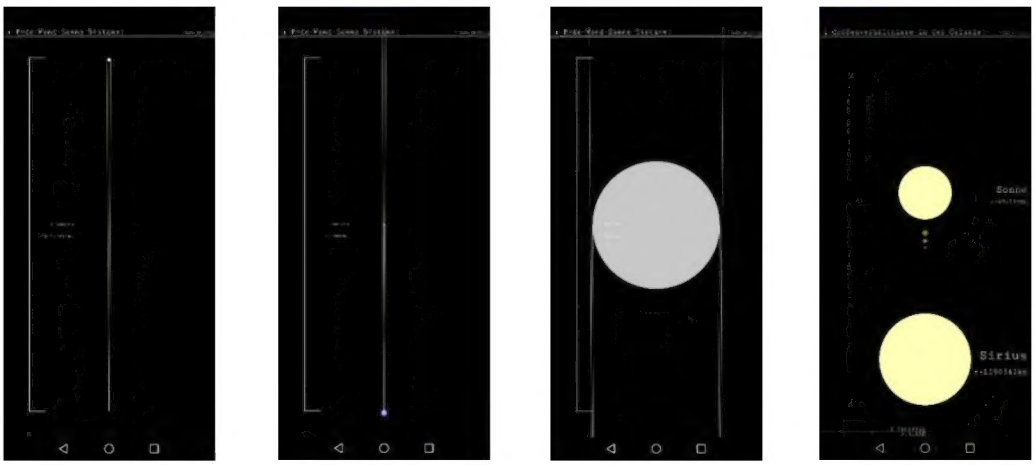

Figure 3. Interactive simulation to display distances between Earth, Moon and Sun with corresponding perspective projection lines; interactive simulation to compare sizes of stars.

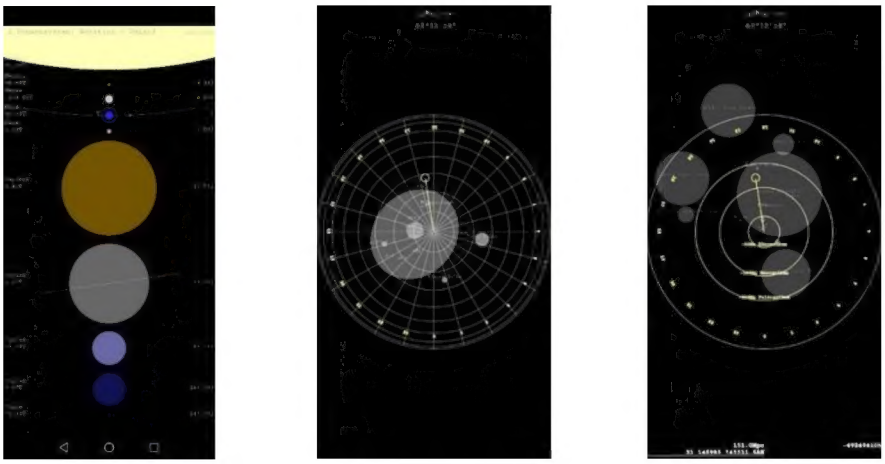

Figure 4. Parameters of the Solar System; Hubble deep field (HDF) located at a right ascension of $12^h36^m49^s$ and a declination of $+62°12'58''$ (see Ferguson, 1996); towards the HDF from a distance of $r = 151\ Mpc$ within the surrounding galaxy clusters and Laniakea supercluster (Tully et al., 2014) with relative historical positions.

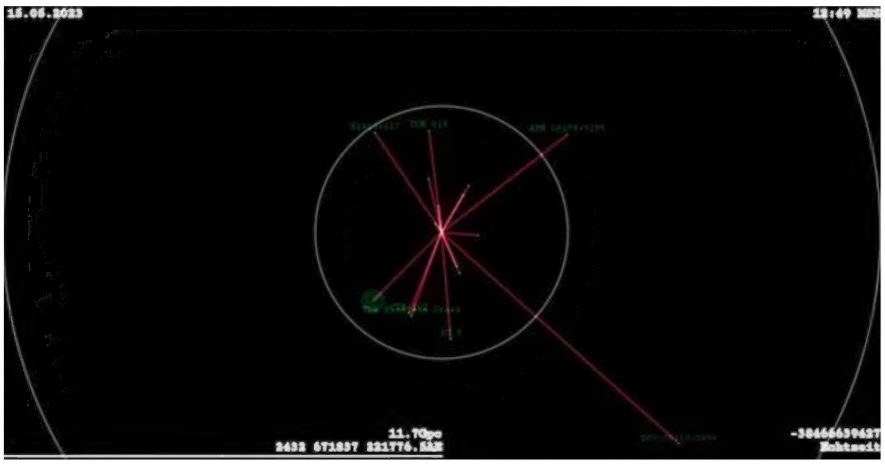

Figure 5. Most distant quasars on the edge of the observable universe at $r > 9\ Gpc$ (see e.g. Wang et al., 2021).

Figure 6. Local star cluster within Orion-Cygnus Arm containing the signs of the Zodiac and surrounding nebulae seen from a distance of $r = 3\ kpc$.

Object distances r in parsec pc are calculated from object parallax π_O, given in milliarcseconds *mas*, with

$$r = \left(\frac{\pi_O}{1000}\right)^{-1}.$$

The *luminosity* distance $r = d_l$ in parsec pc is given by

$$r = 10^{\frac{\mu}{5}+1},$$

with distance modulus μ, defined by the difference between apparent magnitude m and absolute magnitude M as

$$\mu = m - M.$$

Object radii r_O at a given distance r are calculated via angular diameter $V°$, where

$$r_O = r \cdot \tan\frac{V}{2};\ V = \frac{V°}{180} \cdot \pi.$$

For more on photometry see e.g. Miles (2006) or Milone (2011).

Source of main function

```
!!
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

                    SONNENSYSTEMROTATION
                  + semper ubique sum +

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
           © 2020-23 by Dietmar Gerald Schrausser
!!
_name$="SSR"
_ver$="v3.7.25"
INCLUDE strg_.inc
INCLUDE ssr.inc
SENSORS.OPEN 3          %
SENSORS.OPEN 8          %
GR.OPEN 255,0,0,0,0,-1  %
GR.SCREEN sx,sy
GOSUB global            % Globale Variablen
c_m=299792458           % c in m/s (exakt, SI)
au_=149597870700        % AE in m (exakt, quasi SI)
pc_=648000/PI()         % pc aus AE (IAU, 2016)
a_=365.25               % Tage pro Jahr
ca_=360/a_              % Korrekturfaktor bei Simulation
GOSUB astroparameter    %
!
INCLUDE ssr_globals1.bas % Globale Parameter (NASA)
INCLUDE ssr_globals2.bas % Globale Parameter (CDS SIMBAD)
!
GR.BITMAP.CREATE scrs, sx,sy
pat$="../../SSR/"
!
INCLUDE ssr_ini.bas     % ini
GOSUB weitere_ini       %
GOSUB zeit:jx=yr        % Jahr für Simulation
GOSUB tagnr             % Tagnr für Simulation
GOSUB mnt               % Monatslängen
GOSUB dialog            % Hauptmenü
!
st0: %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
DO
 GR.SET.STROKE skl      % 1-5
 IF s07=1               % bei Echtzeit
```

```
 GOSUB zeit            % Aktuelle Zeit
 !
 ! % Schaltjahr %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 sj=0
 IF Yr/4=INT(Yr/4) THEN sj=1
 sj=1
 GOSUB tagnr
 ! % Sommerzeit %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 sz$="":sz=0
 IF nt>=mz+29 & nt<or+24
  sz$="MSZ":sz=1
 ENDIF
 !
 tg=nt+1                  % Tagnummer
 tg=tg+10                 %
 i=((tg/a_)*360)-135      % Tagposition
 j=0                      % Tagzaehler
 jx=yr                    % Jahr
 !
ENDIF
GR.SCREEN sx,sy           % Bildschirmformat
mx=sx/2:my=sy/2
IF sx>sy
 swbs=0                   % Schalter Breitformat
ELSE
 swbs=1                   % Schalter Hochformat
ENDIF
!
mnc=min/60                % Minutentakt
ae=(sx/2.9)/ed       %%%% % Faktor ed zu AE
aed=ae
IF s07=1 THEN v=0         % bei Echtzeit
i=i+v                     % Tagposition bei Simulation
nt=nt+v/ca_               % Tagnummer bei Simulation
!
GR.CLS
GR.TEXT.SETFONT "courier","",1
GR.TEXT.SIZE txz1
IF u00=1
 ! % Oortsche Wolke %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 d=100000             %AE
 gr1=ed*d
 IF u10=1 & ed<50000 & AE<10000000 %
  GR.COLOR 45,60,60,60,1
  GR.CIRCLE sn,mx,my,ed*d
  IF AE<=45000
   GR.COLOR cc,0,0,0,1
   GR.CIRCLE sn,mx,my,ed*d/2
  ENDIF
  IF AE>30&AE<45000
   GR.COLOR 20,60,60,60,1
   GR.CIRCLE sn,mx,my,ed*d/2
  ENDIF
  IF AE>50&AE<45000
   GR.COLOR 15,60,60,60,1
   GR.CIRCLE sn,mx,my,ed*d/2
  ENDIF
  IF u11=1&ae>30000&ae<3000000
   GR.TEXT.ALIGN 2
   GR.COLOR cc,60,60,60,1
   GR.TEXT.DRAW txt,mx,my-gr1-c10,"Oortsche Wolke"
  ENDIF
 ENDIF
 ! % Hills-Wolke, Innere Kometenwolke %%%%%%%%%%%%%%%%%%%
 d=1500                      %AE
 gr1=ed*d
 IF u15=1 & ed<5000 & AE<1000000 %
  IF u10=1:GR.COLOR 35,20,30,30,1
 ELSE:    GR.COLOR 75,20,30,30,1: ENDIF
  GR.CIRCLE sn,mx,my,ed*d*c145
  IF u10=1:GR.COLOR cc,10,10,10,1
 ELSE:    GR.COLOR cc,0,0,0,1: ENDIF
  GR.CIRCLE sn,mx,my,ed*d/4
  IF u11=1&ae>300&ae<30000
   GR.TEXT.ALIGN 2
   GR.COLOR cc,60,60,60,1
   GR.TEXT.DRAW txt,mx,my-gr1-c10,"Hills-Wolke, Innere Kometenwolke"
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  ENDIF
 ENDIF
 ! % Heliosphäre %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 d=150
 gr1=ed*d
 IF u14=1 & ed<500 & AE<100000 %
  GR.COLOR 178,20,10,0,1
  GR.CIRCLE sn,mx,my,ed*(d/1.3)
  GR.COLOR 130,20,10,0,1
  GR.CIRCLE sn,mx,my,ed*(d/1.1)
  GR.COLOR 115,20,10,0,1
  GR.CIRCLE sn,mx,my,ed*d
  IF u11=1&ae>40&ae<2700
   GR.TEXT.ALIGN 2
   GR.COLOR 230,70,60,0,1
   GR.TEXT.DRAW txt,mx,my-gr1-c10,"Heliosphäre"
  ENDIF
 ENDIF
 ! % Kuipergürtel %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 d=45
 gr1=ed*d*c142
 IF u13=1 & ed<500 & AE<100000 %
  GR.COLOR 30,60,60,100,1
  GR.CIRCLE sn,mx,my,ed*d*1.8
  IF u14=1
   GR.COLOR 200,20,10,0,1
  ELSE
   GR.COLOR cc,0,0,0,1
  ENDIF
  GR.CIRCLE sn,mx,my,ed*d
  IF u11=1&ae>20&ae<700
   GR.TEXT.ALIGN 2
   GR.COLOR 200,60,60,100,1
   GR.TEXT.DRAW txt,mx,my-gr1-c10,"Kuipergürtel"
  ENDIF
 ENDIF
 ! % Asteroidengürtel %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 d=3
 gr1=ed*4.8
 IF u04=1 & ed>5 & AE<10000 %
  GR.COLOR 30,100,100,60,1
  GR.CIRCLE sn,mx,my,ed*d*1.8
  IF u14=1
   GR.COLOR cc,20,10,0,1
  ELSE
   GR.COLOR cc,0,0,0,1
  ENDIF
  GR.CIRCLE sn,mx,my,ed*d*c142
  IF u11=1&ae>1.5&ae<45
   GR.TEXT.ALIGN 2
   GR.COLOR 150,100,100,60,1
   GR.TEXT.DRAW txt,mx,my-gr1-c10,"Asteroidengürtel"
  ENDIF
 ENDIF
ENDIF
! % Jahreszeiten %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
IF s01=1
 GR.COLOR 35,cc,cc,0,1
 GR.LINE ln,0,my,sx,my
 GR.LINE ln,mx,0,mx,sy
 ! %Namen
 stl=431
 ac=360/24
 lt=sy/4.8125           % // Distanz //
 GR.TEXT.ALIGN 2
 GR.TEXT.SIZE txz4      %12
 GR.COLOR 40,cc,cc,0,1
 GR.ROTATE.START stl+ac,mx,my
 GR.TEXT.DRAW tx,mx+c02,my-lt,"W"
 GR.ROTATE.END
 GR.ROTATE.START stl+7*ac,mx,my
 GR.TEXT.DRAW tx,mx+c02,my-lt,"H"
 GR.ROTATE.END
 GR.ROTATE.START stl+13*ac,mx,my
 GR.TEXT.DRAW tx,mx+c02,my-lt,"S"
 GR.ROTATE.END
 GR.ROTATE.START stl+19*ac,mx,my
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 GR.TEXT.DRAW tx,mx+c02,my-lt,"F"
 GR.ROTATE.END
ENDIF
! % Himmelsgewölbe %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
IF t34=1 & ae>=Lj_
 GR.COLOR 35,cc/2,cc/2,cc/2,0
 FOR hg=0 TO 90 STEP 10
  GR.CIRCLE cl,mx,my,mx*SIN(TORADIANS(hg))
 NEXT
 FOR w=1 TO 24
  GR.ROTATE.START w/24*360,mx,my
  GR.LINE ln, 0,my,mx-sx/108,my
  GR.ROTATE.END
 NEXT
ENDIF
! % Rektaszension %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
IF swbs % nur im Hochformat
 IF t31=1 & ae>=Lj_
  GR.TEXT.ALIGN 3
  GR.TEXT.SIZE txz1 %9
  GR.COLOR 80, cc,cc,0, 0
  IF s08=1:cor=0:ELSE:cor=1.1:ENDIF
  FOR hr=0 TO 24
   GR.ROTATE.START ((hr/24)*360)-cor,mx,my
   IF hr>0
    GR.TEXT.DRAW tx,mx,sx*c142,INT$(24-hr)
   ENDIF
   GR.ROTATE.END
  NEXT
  dsn=1
  IF t39=1 % Deklination %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
   dg_x=dg_:dm_x=dm_:ds_x=ds_
   GOSUB dekl
   GR.COLOR 80, cc,cc,0, 1
   GR.TEXT.SIZE txz5
   GR.TEXT.ALIGN 2
   GR.TEXT.DRAW tx,mx,sy/4.5,_gd$+dkl$
   GR.COLOR 80, cc,cc,0, 0
  ENDIF
  ! % Positionszeiger %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
  m_1=m_/60
  s_2=s_/6000
  pos=h_+m_1+s_1
  pos1=-(pos/24)*360
  GR.ROTATE.START pos1,mx,my
  GR.LINE ln, mx,my,mx,my+(my/1.96)*dsn
  GR.CIRCLE cl,mx,my+(my/1.93)*dsn,sy/115.5
  GR.ROTATE.END
  GR.COLOR 80, cc,cc,0, 1
  GR.TEXT.SIZE txz5
  GR.TEXT.ALIGN 2
  GR.TEXT.DRAW tx,mx,sy/5,_ga$+rk$
 ENDIF
ENDIF
! % Monate %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
IF s02=1
 FOR s=1 TO 12
  GR.ROTATE.START 180-((s/12)*360)-((10/a_)*360),mx,my
  GR.COLOR 8, cc, cc,cc, 1
  GR.LINE ln,-sx,my,sx*2,my
  GR.ROTATE.END
 NEXT
 ! % Monatsnummern %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 stl=410
 ac=360/24
 lt=sy/6.6          % // Distanz //
 GR.TEXT.ALIGN 2
 GR.TEXT.SIZE txz4
 GR.COLOR 40,cc,cc,cc,1
 GR.ROTATE.START stl+ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"1"
 GR.ROTATE.END
 GR.ROTATE.START stl+3*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"12"
 GR.ROTATE.END
 GR.ROTATE.START stl+5*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"11"
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 GR.ROTATE.END
 GR.ROTATE.START stl+7*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"10"
 GR.ROTATE.END
 GR.ROTATE.START stl+9*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"9"
 GR.ROTATE.END
 GR.ROTATE.START stl+11*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"8"
 GR.ROTATE.END
 GR.ROTATE.START stl+13*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"7"
 GR.ROTATE.END
 GR.ROTATE.START stl+15*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"6"
 GR.ROTATE.END
 GR.ROTATE.START stl+17*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"5"
 GR.ROTATE.END
 GR.ROTATE.START stl+19*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"4"
 GR.ROTATE.END
 GR.ROTATE.START stl+21*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"3"
 GR.ROTATE.END
 GR.ROTATE.START stl+23*ac,mx,my
 GR.TEXT.DRAW tx,mx,my-lt,"2"
 GR.ROTATE.END
ENDIF
! % Sternbilder/Tierkreis %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
IF swbs % nur im Hochformat
 IF t99=1 % & ae>=Lj_
  GR.COLOR 10, cc,cc,0, 0
  IF ae/Lj_<=800
   FOR s=1 TO 12
    GR.ROTATE.START 180-((s/12)*360),mx,my
    GR.LINE ln,-sx,my,sx*2,my
    GR.ROTATE.END
   NEXT
  ENDIF
  IF ae/Lj_<=2000
   % Tierkreissymbole %%%%%%%%%%%%%%%%%%
   GR.COLOR 100,cc,cc,0,1
   GR.TEXT.ALIGN 2
   GR.TEXT.SIZE txz1*1.5 %15
   GR.ROTATE.START 16,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz01$
   GR.ROTATE.END
   GR.ROTATE.START 46,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz02$
   GR.ROTATE.END
   GR.ROTATE.START 75,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz03$
   GR.ROTATE.END
   GR.ROTATE.START 105,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz04$
   GR.ROTATE.END
   GR.ROTATE.START 135,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz05$
   GR.ROTATE.END
   GR.ROTATE.START 165,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz06$
   GR.ROTATE.END
   GR.ROTATE.START 196,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz07$
   GR.ROTATE.END
   GR.ROTATE.START 226,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz08$
   GR.ROTATE.END
   GR.ROTATE.START 256,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz09$
   GR.ROTATE.END
   GR.ROTATE.START 286,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz10$
   GR.ROTATE.END
   GR.ROTATE.START 316,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz11$
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   GR.ROTATE.END
   GR.ROTATE.START 345,mx,my
   GR.TEXT.DRAW tx,mx,my-dis,_tz12$
   GR.ROTATE.END
  ENDIF
  IF ae/Lj_>=800 & ae/Lj_<=90000
   GR.COLOR 20,cc,cc,0,0
   FOR s=1 TO 12
    GR.ROTATE.START 180-((s/12)*360),mx,my
    GR.LINE ln,mx,my,mx+ed*(2000*lj_)*c145,my
    GR.ROTATE.END
   NEXT
   GR.COLOR 45,cc,cc,0,0
   GR.CIRCLE cl,mx,my,ed*(2000*lj_)*c145
  ENDIF
 ENDIF
ENDIF
! % Historie %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
IF t98=1
 GR.COLOR 50,cc,cc,cc/2,0
 GR.TEXT.ALIGN 2
 GR.TEXT.SIZE txz1
 grh=ed*((jx-1969)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"1969 Mondlandung"
 ENDIF
 grh=ed*((jx-1914)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"1914 Erster Weltkrieg"
 ENDIF
 grh=ed*((jx-1848)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"1848 Gründerzeit"
 ENDIF
 grh=ed*((jx-1789)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"1789 Französische Revolution"
 ENDIF
 grh=ed*((jx-1618)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"1618 30-jähriger Krieg"
 ENDIF
 grh=ed*((jx-1492)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"1492 Columbus"
 ENDIF
 grh=ed*((jx-800)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"800 Karl der Große"
 ENDIF
 grh=ed*((jx-476)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"476 Goten"
 ENDIF
 grh=ed*((jx-170)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"170 Ptolemaeus" % [1]
 ENDIF
 grh=ed*((jx-0)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"0 AD"
 ENDIF
 grh=ed*((jx+1200)*Lj_)*c145
 IF grh>40
  GR.CIRCLE cl,mx,my,grh
  GR.TEXT.DRAW txt,mx,my+grh-c10,"-1200 Troja" %[2]
 ENDIF
```

```
  grh=ed*((jx+3500)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-3500 Noah" %[3]
  ENDIF
  grh=ed*((jx+5500)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-5500 Jahr der Welt" %[3]
  ENDIF
  grh=ed*((jx+10000)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-10000 Jungsteinzeit"
  ENDIF
  grh=ed*((jx+48000)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-48000 Jungpaläolithikum"
  ENDIF
  grh=ed*((jx+2600000)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-2.6Ma Altsteinzeit"
  ENDIF
  grh=ed*((jx+66*10^6)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-66Ma Känozoikum"
  ENDIF
  grh=ed*((jx+186.2*10^6)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-186Ma Mesozoikum"
  ENDIF
  grh=ed*((jx+288.8*10^6)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-288Ma Paläozoikum"
  ENDIF
  grh=ed*((jx+2.5*10^9)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-2.5Ga Proterozoikum"
  ENDIF
  grh=ed*((jx+4*10^9)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-4.0Ga Archaikum"
  ENDIF
  grh=ed*((jx+4.6*10^9)*Lj_)*c145
  IF grh>40
   GR.CIRCLE cl,mx,my,grh
   GR.TEXT.DRAW txt,mx,my+grh-c10,"-4.6Ga Hadaikum"
  ENDIF
 ENDIF
!!
References:
[1]Halma, N. (1813). Composition Mathematique de Claude Ptolemee. Vorwort. Paris.
[2]Eratosthenes. (-220). Chronographai. Verloren, nach Kokkinos, 2009.
[3]Petavius, D. (1630). Uranologion sive systema variorum authorum. S. 351. Lutetiae
Parisiorum.
!!
 ! % Grössenvergleich %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 IF swvgl=1
  dst=500
  SW.BEGIN vglst
   SW.CASE 4 %%%%%%%%%%%%%%%%%%
    gr1=(ed*r_btg_ae)*c142
    GR.COLOR (cc-155),cc,0,0,1
    vglst$="'Beteigeuze'"
    SW.BREAK
   SW.CASE 6 %%%%%%%%%%%%%%%%%%
    dst=Lj_*1400
    gr1=(ed*r_orn_ae)*c142
    GR.COLOR cc/3,cc,cc/3,cc/2,1
    vglst$="'Orionnebel'"
```

```
    SW.BREAK
   SW.CASE 2 %%%%%%%%%%%%%%%%%
    gr1=(ed*r_srs_ae)*c142
    GR.COLOR (cc-55),cc,cc,0,1
    vglst$="'Sirius'"
    SW.BREAK
   SW.CASE 1 %%%%%%%%%%%%%%%%%
    gr1=(ed*r_acn_ae)*c142
    GR.COLOR cc-20,cc,cc,cc,1
    vglst$="'"+_ga$+" Centauri A'"
    SW.BREAK
   SW.CASE 3 %%%%%%%%%%%%%%%%%
    gr1=(ed*r_adb_ae)*c142
    GR.COLOR (cc-40),cc,0,0,1
    vglst$="'Aldebaran'"
    SW.BREAK
   SW.CASE 5 %%%%%%%%%%%%%%%%%
    gr1=(ed*r_rsg_ae)*c142
    GR.COLOR (cc-155),cc,0,0,1
    vglst$="'RSGC2-01'"
    SW.BREAK
  SW.END
  GR.TEXT.SIZE txz1
  GR.TEXT.ALIGN 2
  IF t06=1&ae<dst THEN GR.TEXT.DRAW txt,mx,my-gr1-c10,vglst$
  IF ae<dst
   GR.CIRCLE sn,mx,my,gr1
  ENDIF
 ENDIF
 !
 IF u00=1 THEN                    GOSUB sonnensystem
 IF t00=1 & ae>=Lj_ THEN          GOSUB sterne
 IF st00=1 & ae*pc_>92 THEN       GOSUB sternhaufen
 IF nb00=1 & ae*pc_>315 THEN      GOSUB nebel
 IF gm00=1 & ae*pc_>85 THEN       GOSUB milchstrasse
 IF gx00=1 & ae*pc_>cc*10^3  THEN GOSUB galaxien
 IF gh00=1 & ae*pc_>1.3*10^6 THEN GOSUB haufen
 IF gq00=1 & ae*pc_>2*10^8   THEN GOSUB quasare
 IF gw00=1                   THEN GOSUB weitere
 !
 ! % Simulation %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 jc=i-(j*360)
 IF jc>=360-135+10          % Vor
  j=j+1:jx=jx+1:nt=1.25     %%%%%
  !TONE 11500,55
 ENDIF
 IF nt<1                    % Zurück
  j=j-1:jx=jx-1:nt=a_-0.25  %%%%%%%%
  !TONE 11500,55
 ENDIF
 ! % Textoutput %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 GR.COLOR 80,cc,cc,cc,0
 GR.TEXT.ALIGN 3
 GR.TEXT.SIZE txz3             %
 IF s10=1                      % Skala
  GR.LINE ln,0, sy-sy/177.69,   mx,sy-sy/165
  GR.LINE ln,0, sy-sy/144.375,  0, sy-sy/210
  GR.LINE ln,mx,sy-sy/144.375,  mx,sy-sy/210
  GR.LINE ln,mx/2,sy-sy/144.375,mx/2,sy-sy/210
  IF AE<Lj_*0.1
   GR.TEXT.DRAW txt,mx,sy-dtx3,FORMAT$("#####.##",AE)+" AE"
  ENDIF
  IF AE>=Lj_*0.1               % 1Lichtjahr
   GR.COLOR 30,cc,cc,cc,0
   GR.CIRCLE cl,mx,my,mx       % Skala
   GR.COLOR 80,cc,cc,cc,0
   IF AE<Lj_*pcl_
    GR.TEXT.DRAW txt,mx,sy-dtx3,FORMAT$("# ######.##",ae)+" AE"
    GR.TEXT.DRAW txt,mx,sy-dtx2,FORMAT$("#.##",ae/Lj_)+" Lj"
   ENDIF
  ENDIF
  IF AE>=Lj_*pcl_              % 1Parsec
   CLIPBOARD.PUT STR$(ae/pc_)
   GR.TEXT.DRAW txt,mx,sy-dtx3,FORMAT$("###### ###### ######.##",AE)+" AE"
   IF ae<Lj_*(pcl_*10^3)       %
    GR.TEXT.DRAW txt,mx,sy-dtx2,FORMAT$("###.##",ae/pc_)+"pc"
   ENDIF
```

```
IF ae>=Lj_*(pcl_*10^3)       %
 IF ae<Lj_*(pcl_*10^6)       %
  GR.TEXT.DRAW txt,mx,sy-dtx2,FORMAT$("###.##",(ae/pc_)/10^3)+" kpc"
 ENDIF
 IF ae>=Lj_*(pcl_*10^6) & ae<Lj_*(pcl_*10^9)
  GR.TEXT.DRAW txt,mx,sy-dtx2,FORMAT$("# ###### ######.##",(ae/pc_)/10^6)+" Mpc"
 ENDIF
 IF ae>=Lj_*(pcl_*10^9)
  mxd=ae/pc_:IF mxd>=14.25*10^9 THEN mxd=14.25*10^9
  CLIPBOARD.PUT STR$(mxd)
  GR.TEXT.DRAW txt,mx,sy-dtx2,FORMAT$("# ###### ######.##",mxd/10^9)+" Gpc"
 ENDIF
ENDIF
ENDIF
GR.TEXT.ALIGN 3
IF s07=0                     % bei Vollsimulation
 GR.TEXT.DRAW txt,sx,sy-dtx3,FORMAT$("# ###### ###### ###### ######",v_)+" AE/h"
 GR.TEXT.DRAW txt,sx,sy-dtx2,FORMAT$("# ###### ###### ######",v_c)+"c"
ENDIF
IF s07=1                     % bei Echtzeit
 GR.TEXT.DRAW txt,sx,sy-dtx2,FORMAT$("## ###### ######",VAL(y$)-AE/Lj_+1)
ENDIF
IF s07=-1                    % bei Simulation
 GR.TEXT.DRAW txt,sx,sy-dtx2,FORMAT$("## ###### ######",jx-AE/Lj_+1)
ENDIF
ENDIF
IF s09=1 % Text %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 IF s07=0                     % bei Vollsimulation
  GR.TEXT.ALIGN 1
  GR.TEXT.DRAW txt,dtx4,dtx1,"SSR SONNENSYSTEMROTATION "+_ver$+" Vollsimulation"
  GR.TEXT.DRAW  txt,dtx4,dtx1+dtx1,"Copyright  "+_cr$+"  2023  by  Dietmar  Gerald
Schrausser"
 ENDIF
 IF s07=-1                    % bei Simulation
  GR.TEXT.ALIGN 1
  GR.TEXT.DRAW txt,dtx4,dtx1,INT$(jx)
  GR.TEXT.ALIGN 3
  GR.TEXT.DRAW txt,sx,dtx1,INT$(nt+1)+"T"
  GR.TEXT.DRAW txt,sx,sy-dtx3,"Simulation: "+STR$(ROUND(v/0.1,3))+"×"
 ENDIF
 IF s07=1                     % bei Echtzeit
  GR.TEXT.ALIGN 1
  GR.TEXT.DRAW txt,dtx4,dtx1,d$+"."+m$+"."+y$
  GR.TEXT.ALIGN 3
  GR.TEXT.DRAW txt,sx,dtx1,h$+":"+min$+" "+sz$
  GR.TEXT.DRAW txt,sx,sy-dtx3,"Echtzeit"
 ENDIF
ENDIF
! % Kompass %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
IF swbs % nur im Hochformat
 IF s08=1
  lg=35:p=10
  SENSORS.READ 3,cp,cpi,crl
  IF swk=1| swk=0
   GR.COLOR cc/3,cc,50,50,1
   GR.CIRCLE cl,mx,my/(p/2),sx/83
   GR.COLOR cc/1.5,cc,50,50,0
   GR.CIRCLE cl,mx+sx/83*crl/90,my/(p/2)+sx/83*cpi/90,sx/83
   GR.CIRCLE cl,mx,my/(p/2),sx/540
   GR.ROTATE.START 360-cp,mx,sy/p
   GR.CIRCLE cl,mx,sy/p-lg+sx/135,sx/1080
   GR.TEXT.ALIGN 2
   GR.TEXT.SIZE txz2 %10
   GR.TEXT.DRAW tx, mx,sy/p-lg,"N"
   GR.ROTATE.END
   GR.ROTATE.START 180-cp,mx,sy/p
   GR.TEXT.DRAW tx, mx,sy/p-lg,"S"
   GR.CIRCLE cl,mx,sy/p-lg-sx/108,sx/1080
   GR.ROTATE.END
   GR.ROTATE.START 90-cp,mx,sy/p
   GR.TEXT.DRAW tx, mx,sy/p-lg,"O"
   GR.ROTATE.END
   GR.ROTATE.START 270-cp,mx,sy/p
   GR.TEXT.DRAW tx, mx,sy/p-lg,"W"
   GR.ROTATE.END
  ENDIF
 ENDIF
```

```
 ENDIF
 ! % Touch Ereignisse %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 GR.TOUCH2 t2,tx,ty
 IF t2
  GOSUB dialog
 ENDIF
 GR.TOUCH tc,tx,ty
 IF tc
  IF ae/pc_<14.25*10^9          % // max Entfernung //
   IF ty<sy/3 THEN ed=ed/vse    %%%%%%%%
  ENDIF
  IF ae>=0.002                  % // min Entfernung //
   IF ty>sy*2/3 THEN ed=ed*vse  %%%%%%%%
  ENDIF
  IF s07=-1                     % bei Simulation
   IF ty<=sy*2/3 & ty>=sy/3
    IF tx<mx THEN v=v+vsmn
    IF tx>mx THEN v=v-vsmn
    IF v>10 THEN v=10           % Grenzwert 100x
    IF v<-10 THEN v=-10         %
   ENDIF
  ENDIF
 ENDIF
 ! % Vollsimulation %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 IF s07=0
  IF sw=1
   ed=ed/vsm %%%%%%%%
   IF ae/pc_>=vsm_mx:sw=-1:PAUSE 2000:ENDIF
  ENDIF
  IF sw=-1
   ed=ed*vsm %%%%%%%%
   IF ae<=vsm_mn:sw=1:PAUSE 2000:ENDIF
  ENDIF
  GOSUB zeit
  IF sec<>sec1                  % Geschwindigkeit
   sec1=sec
   v_=ABS(ae-ae1)*3600          % AE/h
   v_c=v_*(au_/1000)
   v_c=v_c/c_                   % c
   ae1=ae
  ENDIF
 ENDIF
 !
 GR.RENDER
 ! % SCRS %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 IF s11=1
  SENSORS.READ 8,dmy,dmy,bwg
  IF bwg=0 THEN sw0=1
  IF bwg=1&sw0=1
   scrs$=pat$+_name$+Y$+M$+D$+h$+min$+sec$
   GR.SCREEN.TO_BITMAP scrs
   GR.BITMAP.SAVE scrs,scrs$
   TONE 11500,55
   sw0=0
  ENDIF
  !
 ENDIF
 IF s07=1    % bei Echtzeit
  v=0.1      % Umlaufgeschwindigkeit bei Simulation
  sw=1       % Vollsimulation Schalter
  sec1=-1    %
 ENDIF
UNTIL 0
!
ONERROR:
GOSUB fin
END
ONMENUKEY:
GOSUB dialog
MENUKEY.RESUME
ONBACKKEY:
GOSUB fin
END
!
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Subroutinen %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
zeit:
```

```
TIME Y$, M$, D$, h$, min$, sec$
yr=VAL(Y$)
sec=VAL(sec$)
nt=VAL(D$)
nm=VAL(M$)
st=VAL(h$)
min=VAL(min$)
RETURN
! % Globale Variablen %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global:
clz1=sx/28              % Textgröße 8
clz2=sx/52              % Textgröße 4
clz3=sx/47              % Textgröße 5
clz4=sx/41              % Textgröße 6
clz5=sx/100             % Textgröße 1
clz6=sx/80              % Textgröße 2
txz1=sx/50              % Textgröße 12
txz2=sx/60              % Textgröße 10
txz3=sx/35              %
txz4=sx/36              %
txz5=sx/31              %
txzi=clz1               % Textgröße info
txzi2=sx/30             % Textgröße info2
dtx1=sy/80              % Text Abstand 1
dtx2=sy/40              % Text Abstand 2
dtx3=sy/100             % Text Abstand 3
dtx4=sx/100             % Text Abstand 4
c145=1.45               % sx/760 %1.45 corr
c142=1.42               % 1.42 corr
c10=sy/231              % 10 corr
c01=sx/1080             % 1 corr
c02=c01*2               % 2 corr
cc=255                  % Farbe
dis=sy/5.372            % Tierkreis Distanz
gr_0=sx/400             % allg. Objekt Größe
swvgl=-1                % sw Grössenvergleich
!ed=ed/aed              % Anfangsentfernung
vgr=1                   % Vergrößerungsfaktor
vgrp0=100               % Vergrößerungsfaktor 0 Planeten
vgrs0=200000            % Vergrößerungsfaktor 0 Sterne
CLIPBOARD.PUT "0"       % Berechnungen
RETURN
! Bei Start %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
astroparameter:
pcm_=pc_*au_            % pc in m
c_=c_m*3.6              % c in km/h
Lj_m=c_m*31557600       % Lj in m
Lj_=Lj_m/au_            % Lj in AE
pcl_=pcm_/Lj_m          % pc in Lj
GOSUB sterne            %
GOSUB sternhaufen       %
GOSUB nebel             %
GOSUB milchstrasse      %
GOSUB galaxien          %
GOSUB haufen            %
GOSUB quasare           %
GOSUB weitere_in        %
RETURN
! % Tagesanzahl %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
tagnr:
nt=nt-1
IF nm>1 THEN nt=nt+31
IF nm>2 THEN nt=nt+28+sj
IF nm>3 THEN nt=nt+31
IF nm>4 THEN nt=nt+30
IF nm>5 THEN nt=nt+31
IF nm>6 THEN nt=nt+30
IF nm>7 THEN nt=nt+31
IF nm>8 THEN nt=nt+31
IF nm>9 THEN nt=nt+30
IF nm>10 THEN nt=nt+31
IF nm>11 THEN nt=nt+30
RETURN
! % Monatslängen %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
mnt:
Fr=31
Mz=Fr+28+sj
```

```
Al=Mz+31
Mi=Al+30
Ji=Mi+31
Jl=Ji+30
At=Jl+31
Sr=At+31
Or=Sr+30
Nr=Or+31
Dr=Nr+30
RETURN
! % Position Rekta in Grad %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
r_pos:
m_x=m_x/60
s_x=s_x/6000
pos1=h_x+m_x+s_x
pos=pos1*-(360/24)-135
RETURN
! % Deklination %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dekl:
dm_x=dm_x/60
ds_x=ds_x/6000
dkl=dg_x+dm_x+ds_x
d=d*COS(TORADIANS(dkl))
d=d*Lj_
dsn=(COS(TORADIANS(dkl)))
RETURN
! % Sonnensystem %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
sonnensystem::INCLUDE ssr_sonnensystem.bas:RETURN
! % Sterne, Sternhaufen und Nebel %%%%%%%%%%%%%%%%%%%%%%%%%%
sterne::      INCLUDE ssr_sterne.bas:RETURN
sternhaufen::INCLUDE ssr_sternhaufen.bas:RETURN
nebel::       INCLUDE ssr_nebel.bas:RETURN
! % Milchstraßensystem %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
milchstrasse::INCLUDE ssr_milchstrasse.bas:RETURN
! % Galaxien, Galaxienhaufen weitere Objekte %%%%%%%%%%%%%%
galaxien::INCLUDE ssr_galaxien.bas:RETURN
haufen::  INCLUDE ssr_haufen.bas:  RETURN
quasare:: INCLUDE ssr_quasare.bas: RETURN
weitere:: INCLUDE ssr_weitere.bas: RETURN
! % Beobachtbares Universum r=14.25 Gpc %%%%%%%%%%%%%%%%%%
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Objektdarstellung %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
objdarst:
GR.ROTATE.START pos,mx,my
IF ae<200*d                          %Darstellung
 IF symsw=-1 THEN symb=gr_0          %Symbol
 IF symsw=1 THEN symb=rds            %Maßstab
 !IF otype=-1 | symsw=-1
 IF symsw=-1
  GR.CIRCLE cl,mx-ed*d,my-ed*d,symb*vgr
 ENDIF
 !
 !IF otype=0 & symsw=1
 IF symsw=1
  GR.CIRCLE cl,mx-ed*d,my-ed*d,(ed*symb*Lj_)*vgr
 ENDIF
ENDIF
IF t06=1 & ae<5*d                    %Text
 GR.ROTATE.START -pos,mx-ed*d,my-ed*d
 GR.TEXT.ALIGN 2
 GR.TEXT.SIZE txz1                   %11
 GR.TEXT.DRAW txt,mx-ed*d,my-ed*d-c10,objname$
 GR.ROTATE.END
ENDIF
IF pro_=1                            %Projektion
 erd=TORADIANS(-i-45-pos)
 ex1= mx-(ed*c145)*SIN(-erd)
 ey1= my-(ed*c145)*COS(erd)
 GR.COLOR 30,cc,cc/3,cc/2,0          %%% gosub color
 GR.LINE ln, mx-ed*d,my-ed*d, ex1,ey1
ENDIF
GR.ROTATE.END
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Haupt-Dialog Parameter %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialogprm:
u00=-1
```

```
t00=-1
s07=1
s09=1
s11=1
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog:
GOSUB anfangsentfernung %aed$
GOSUB menu
std:
ARRAY.LOAD
sel$[],o05$,o06$,o12$,o13$,o14$,o15$,o17$,o16$,o18$,o10$,o09$,o07$,o11$,"Ok",_ex$+"
Exit"
DIALOG.SELECT sel, sel$[],_name$+" SONNENSYSTEMROTATION "+_ver$+" - Ebenen:"
IF sel=1:GOSUB dialog1:ENDIF
IF sel=2:GOSUB dialog2:ENDIF
IF sel=3:GOSUB dialog4:ENDIF
IF sel=4:GOSUB dialog5:ENDIF
IF sel=5:GOSUB dialog6:ENDIF
IF sel=6:GOSUB dialog7:ENDIF
IF sel=7:GOSUB dialog8:ENDIF
IF sel=8:GOSUB dialog9:ENDIF
IF sel=9:GOSUB dialog11:ENDIF
IF sel=10:GOSUB dialog10:ENDIF
IF sel=11:s09=s09*-1:ENDIF
IF sel=12:GOSUB dialog3:ENDIF
IF sel=13:s11=s11*-1:ENDIF
IF sel=14:RETURN:   ENDIF
IF sel=15:GOSUB fin: END:  ENDIF
GOSUB menu
GOTO std
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu:
IF u00=1:o05$=smb$+"  Sonnensystem...":ENDIF
IF u00=-1:o05$="     Sonnensystem aus":ENDIF
IF t00=1:o06$=smb$+"  Sterne...":ENDIF
IF t00=-1:o06$="     Sterne aus":ENDIF
IF st00=1:o12$=smb$+"  Sternhaufen...":ENDIF
IF st00=-1:o12$="     Sternhaufen aus":ENDIF
IF nb00=1:o13$=smb$+"  Nebel...":ENDIF
IF nb00=-1:o13$="     Nebel aus":ENDIF
IF gm00=1:o14$=smb$+"  Milchstraße...":ENDIF
IF gm00=-1:o14$="     Milchstraße aus":ENDIF
IF gx00=1:o15$=smb$+"  Galaxien...":ENDIF
IF gx00=-1:o15$="     Galaxien aus":ENDIF
IF gh00=1:o17$=smb$+"  Galaxienhaufen...":ENDIF
IF gh00=-1:o17$="     Galaxienhaufen aus":ENDIF
IF gq00=1:o16$=smb$+"  Quasare...":ENDIF
IF gq00=-1:o16$="     Quasare aus":ENDIF
IF gw00=1:o18$=smb$+"  Weitere...":ENDIF
IF gw00=-1:o18$="     Weitere aus":ENDIF
IF s07=1:o07$=smq$+"  Echtzeit @ "+aed$:ENDIF
IF s07=-1:o07$= smq$+ "  Simulation @ "+aed$:ENDIF
IF s07=0:o07$=oo$+"  Vollsimulation":ENDIF
!IF s07=2:o07$="i  Information":ENDIF
IF s09=1:o09$=smb$+"  Text":ENDIF
IF s09=-1:o09$="     Text aus":ENDIF
IF s10=1:o10$=smb$+"  Skalen...":ENDIF
IF s10=-1:o10$="     Skalen aus":ENDIF
IF s11=1:o11$=smb$+"  SCRS":ENDIF
IF s11=-1:o11$="     SCRS aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Dialog Sonnensystem %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog1prm:
s00=1
u00=1
u01=-1
u02=-1
u03=-1
u04=1
u05=-1
u06=-1
u07=-1
u08=-1
u09=-1
```

```
u10=1
u11=1
u13=1
u14=1
u15=1
u16=1
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog1:
GOSUB menu1
std1:
ARRAY.LOAD
sel1$[],q00$,q20$,q01$,q02$,q03$,q04$,q05$,q06$,q07$,q08$,q09$,q13$,q14$,q15$,q10$,q1
2$,q16$,q11$,"Ok"
DIALOG.SELECT sel1, sel1$[],"Sonnensystem: Darstellung/Projektion:"
IF sel1=1:u00=u00*-1:ENDIF
IF sel1=2:s00=s00*-1:ENDIF
IF sel1=3:u01=u01*-1:ENDIF
IF sel1=4:u02=u02*-1:ENDIF
IF sel1=5:u03=u03*-1:ENDIF
IF sel1=6:u04=u04*-1:ENDIF
IF sel1=7:u05=u05*-1:ENDIF
IF sel1=8:u06=u06*-1:ENDIF
IF sel1=9:u07=u07*-1:ENDIF
IF sel1=10:u08=u08*-1:ENDIF
IF sel1=11:u09=u09*-1:ENDIF
IF sel1=12:u13=u13*-1:ENDIF
IF sel1=13:u14=u14*-1:ENDIF
IF sel1=14:u15=u15*-1:ENDIF
IF sel1=15:u10=u10*-1:ENDIF
IF sel1=16:GOSUB dlgvgr:vgr_p=_vgr:ENDIF
IF sel1=17:u16=u16*-1:ENDIF
IF sel1=18:u11=u11*-1:ENDIF
IF sel1=19:RETURN:   ENDIF
GOSUB menu1
GOTO std1
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu1:
IF u00=1:q00$=smb$+"  Ebene an":ENDIF
IF u00=-1: q00$="     Ebene aus":ENDIF
IF s00=1:q20$=smb$+"  Umlaufbahnen":ENDIF
IF s00=-1: q20$="     Umlaufbahnen aus":ENDIF
IF u01=1:q01$=smb$+"  Merkur ["+STR$(ROUND(d_mkr_ae,1))+"AE]":ENDIF
IF u01=-1: q01$="     Merkur ["+STR$(ROUND(d_mkr_ae,1))+"AE]":ENDIF
IF u02=1:q02$=smb$+"  Venus ["+STR$(ROUND(d_vns_ae,1))+"AE]":ENDIF
IF u02=-1: q02$="     Venus ["+STR$(ROUND(d_vns_ae,1))+"AE]":ENDIF
IF u03=1:q03$=smb$+"  Mars ["+STR$(ROUND(d_mrs_ae,1))+"AE]":ENDIF
IF u03=-1: q03$="     Mars ["+STR$(ROUND(d_mrs_ae,1))+"AE]":ENDIF
IF u04=1:q04$=smb$+"  Asteroidengürtel [~3.3AE]":ENDIF
IF u04=-1: q04$="     Asteroidengürtel [~3.3AE]":ENDIF
IF u05=1:q05$=smb$+"  Jupiter ["+STR$(ROUND(d_jpt_ae,1))+"AE]":ENDIF
IF u05=-1: q05$="     Jupiter ["+STR$(ROUND(d_jpt_ae,1))+"AE]":ENDIF
IF u06=1:q06$=smb$+"  Saturn ["+STR$(ROUND(d_stn_ae,1))+"AE]":ENDIF
IF u06=-1: q06$="     Saturn ["+STR$(ROUND(d_stn_ae,1))+"AE]":ENDIF
IF u07=1:q07$=smb$+"  Uranus ["+STR$(ROUND(d_urs_ae,1))+"AE]":ENDIF
IF u07=-1: q07$="     Uranus ["+STR$(ROUND(d_urs_ae,1))+"AE]":ENDIF
IF u08=1:q08$=smb$+"  Neptun ["+STR$(ROUND(d_npt_ae,1))+"AE]":ENDIF
IF u08=-1: q08$="     Neptun ["+STR$(ROUND(d_npt_ae,1))+"AE]":ENDIF
IF u13=1:q13$=smb$+"  Kuipergürtel [~40AE]":ENDIF
IF u13=-1: q13$="     Kuipergürtel [~40AE]":ENDIF
IF u14=1:q14$=smb$+"  Heliosphäre [~100AE]":ENDIF
IF u14=-1: q14$="     Heliosphäre [~100AE]":ENDIF
IF u09=1:q09$=smb$+"  Pluto [39.5AE]":ENDIF
IF u09=-1: q09$="     Pluto [39.5AE]":ENDIF
IF u15=1:q15$=smb$+"  Hills-Wolke [~875AE]":ENDIF
IF u15=-1: q15$="     Hills-Wolke [~875AE]":ENDIF
IF u10=1:q10$=smb$+"  Oortsche Wolke [~0.8Lj]":ENDIF
IF u10=-1: q10$="     Oortsche Wolke [50000AE]":ENDIF
q12$=smq$+"  Vergrößerung: "+INT$(vgr_p)+" ×"
IF u16=-1:q16$=_smbl$+"    Symbol":ENDIF
IF u16=1:q16$=_mst$+"    Maßstab × "+INT$(vgrp0):ENDIF
IF u11=1:q11$=smb$+"  Text":ENDIF
IF u11=-1: q11$="     Text aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Dialog Sterne %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
dialog2prm:
t00=1
t01=-1
t02=-1
t03=-1
t05=-1
t06=1
t07=-1
t08=-1
t09=-1
t10=-1
t11=-1
t12=-1
t13=-1
t14=-1
t15=-1
t17=-1
t18=-1
t19=-1
t20=-1
t32=-1
t33=-1
t35=-1
t36=-1
t38=-1
t73=-1
t74=-1
t75=-1
t76=-1
t77=-1
t78=-1
t79=-1
t80=-1
t81=-1
t82=-1
t83=-1
t84=-1
t85=-1
t86=-1
t87=-1
t88=-1
t89=-1
t90=-1
t91=-1
t92=-1
t93=-1
t94=-1
t95=-1
t96=-1
t97=-1
t100=-1
t101=-1
t102=-1
t103=-1
t104=-1
t105=-1
t106=-1
t107=-1
t108=-1
t109=-1
t110=-1
t111=-1
t112=-1
t113=-1
t114=-1
t115=-1
t116=-1
t117=-1
t118=-1
t119=-1
t120=-1
t121=-1
t122=-1
t123=-1
t124=-1
t125=-1
t126=-1
```

```
t127=-1
t128=-1
t129=-1
t130=-1
s99=-1
s101=-1
t06s=1
!!
 t__=-1
!!
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog2:
GOSUB menu2
std2:
ARRAY.LOAD
sel2$[],p00$,p01$,p82$,p05$,p35$,p08$,p07$,p36$,p09$,p38$,p03$,p11$,p12$,p33$,p10$,p8
3$,p02$,p84$,p85$,p86$,p13$,p87$,p88$,p89$,p90$,p91$,p14$,p92$,p93$,p94$,p95$,p96$,p9
7$,p100$,p101$,p102$,p103$,p104$,p105$,p106$,p107$,p108$,p109$,p110$,p111$,p112$,p113
$,p32$,p114$,p115$,p116$,p117$,p118$,p15$,p119$,p120$,p121$,p17$,p122$,p18$,p123$,p12
4$,p19$,p125$,p126$,p127$,p128$,p20$,p129$,p130$,s99$,s100$,s101$,p06$,"Ok"
DIALOG.SELECT sel2, sel2$[],"Sterne: Darstellung/Projektion:"
IF sel2=1:t00=t00*-1:IF t00=-1 THEN RETURN:ENDIF
IF sel2=2:t01=t01*-1:ENDIF
IF sel2=3:t82=t82*-1:ENDIF
IF sel2=4:t05=t05*-1:ENDIF
IF sel2=5:t35=t35*-1:ENDIF
IF sel2=6:t08=t08*-1:ENDIF
IF sel2=7:t07=t07*-1:ENDIF
IF sel2=8:t36=t36*-1:ENDIF
IF sel2=9:t09=t09*-1:ENDIF
IF sel2=10:t38=t38*-1:ENDIF
IF sel2=11:t03=t03*-1:ENDIF
IF sel2=12:t11=t11*-1:ENDIF
IF sel2=13:t12=t12*-1:ENDIF
IF sel2=14:t33=t33*-1:ENDIF
IF sel2=15:t10=t10*-1:ENDIF
IF sel2=16:t83=t83*-1:ENDIF
IF sel2=17:t02=t02*-1:ENDIF
IF sel2=18:t84=t84*-1:ENDIF
IF sel2=19:t85=t85*-1:ENDIF
IF sel2=20:t86=t86*-1:ENDIF
IF sel2=21:t13=t13*-1:ENDIF
IF sel2=22:t87=t87*-1:ENDIF
IF sel2=23:t88=t88*-1:ENDIF
IF sel2=24:t89=t89*-1:ENDIF
IF sel2=25:t90=t90*-1:ENDIF
IF sel2=26:t91=t91*-1:ENDIF
IF sel2=27:t14=t14*-1:ENDIF
IF sel2=28:t92=t92*-1:ENDIF
IF sel2=29:t93=t93*-1:ENDIF
IF sel2=30:t94=t94*-1:ENDIF
IF sel2=31:t95=t95*-1:ENDIF
IF sel2=32:t96=t96*-1:ENDIF
IF sel2=33:t97=t97*-1:ENDIF
IF sel2=34:t100=t100*-1:ENDIF
IF sel2=35:t101=t101*-1:ENDIF
IF sel2=36:t102=t102*-1:ENDIF
IF sel2=37:t103=t103*-1:ENDIF
IF sel2=38:t104=t104*-1:ENDIF
IF sel2=39:t105=t105*-1:ENDIF
IF sel2=40:t106=t106*-1:ENDIF
IF sel2=41:t107=t107*-1:ENDIF
IF sel2=42:t108=t108*-1:ENDIF
IF sel2=43:t109=t109*-1:ENDIF
IF sel2=44:t110=t110*-1:ENDIF
IF sel2=45:t111=t111*-1:ENDIF
IF sel2=46:t112=t112*-1:ENDIF
IF sel2=47:t113=t113*-1:ENDIF
IF sel2=48:t32=t32*-1:ENDIF
IF sel2=49:t114=t114*-1:ENDIF
IF sel2=50:t115=t115*-1:ENDIF
IF sel2=51:t116=t116*-1:ENDIF
IF sel2=52:t117=t117*-1:ENDIF
IF sel2=53:t118=t118*-1:ENDIF
IF sel2=54:t15=t15*-1:ENDIF
IF sel2=55:t119=t119*-1:ENDIF
```

```
IF sel2=56:t120=t120*-1:ENDIF
IF sel2=57:t121=t121*-1:ENDIF
IF sel2=58:t17=t17*-1:ENDIF
IF sel2=59:t122=t122*-1:ENDIF
IF sel2=60:t18=t18*-1:ENDIF
IF sel2=61:t123=t123*-1:ENDIF
IF sel2=62:t124=t124*-1:ENDIF
IF sel2=63:t19=t19*-1:ENDIF
IF sel2=64:t125=t125*-1:ENDIF
IF sel2=65:t126=t126*-1:ENDIF
IF sel2=66:t127=t127*-1:ENDIF
IF sel2=67:t128=t128*-1:ENDIF
IF sel2=68:t20=t20*-1:ENDIF
IF sel2=69:t129=t129*-1:ENDIF
IF sel2=70:t130=t130*-1:ENDIF
!!
 IF sel2=_:t__=t__*-1:ENDIF
!!
IF sel2=71:GOSUB sreset: s99=s99*-1:ENDIF
IF sel2=72
 GOSUB dlgvgr
 vgr_s=_vgr:IF s101=1 THEN vgr_s=vgr_s
 vgr=vgr_s
ENDIF
IF sel2=73:s101=s101*-1:ENDIF
IF sel2=74:t06s=t06s*-1:ENDIF
IF sel2=75:RETURN:   ENDIF
GOSUB menu2
GOTO std2
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu2:
IF t00=1:p00$=smb$+"  Ebene an":ENDIF
IF t00=-1: p00$="     Ebene aus":ENDIF
IF t01=1:p01$=smb$+"  "+_ga$+" Centauri ["+STR$(ROUND(s_d01,1))+"pc]":ENDIF
IF t01=-1: p01$="     "+_ga$+" Centauri ["+STR$(ROUND(s_d01,1))+"pc]":  ENDIF
IF t82=1:p82$=smb$+"  Barnards Stern ["+STR$(ROUND(s_d02,1))+"pc]":ENDIF
IF t82=-1: p82$="     Barnards Stern ["+STR$(ROUND(s_d02,1))+"pc]":ENDIF
IF t05=1:p05$=smb$+"  Sirius ["+STR$(ROUND(s_d03,1))+"pc]":ENDIF
IF t05=-1: p05$="     Sirius ["+STR$(ROUND(s_d03,1))+"pc]":ENDIF
IF t35=1:p35$=smb$+"  Procyon ["+STR$(ROUND(s_d04,1))+"pc]":ENDIF
IF t35=-1: p35$="     Procyon ["+STR$(ROUND(s_d04,1))+"pc]":ENDIF
IF t08=1:p08$=smb$+"  Altair ["+STR$(ROUND(s_d05,1))+"pc]":ENDIF
IF t08=-1: p08$="     Altair ["+STR$(ROUND(s_d05,1))+"pc]":ENDIF
IF t07=1:p07$=smb$+"  Vega ["+STR$(ROUND(s_d06,1))+"pc]":ENDIF
IF t07=-1: p07$="     Vega ["+STR$(ROUND(s_d06,1))+"pc]":ENDIF
IF t36=1:p36$=smb$+"  Fomalhaut ["+STR$(ROUND(s_d07,1))+"pc]":ENDIF
IF t36=-1: p36$="     Fomalhaut ["+STR$(ROUND(s_d07,1))+"pc]":ENDIF
IF t09=1:p09$=smb$+"  Pollux ["+STR$(ROUND(s_d08,1))+"pc]":ENDIF
IF t09=-1: p09$="     Pollux ["+STR$(ROUND(s_d08,1))+"pc]":ENDIF
IF t38=1:p38$=smb$+"  Denebola ["+STR$(ROUND(s_d09,1))+"pc]":ENDIF
IF t38=-1: p38$="     Denebola ["+STR$(ROUND(s_d09,1))+"pc]":ENDIF
IF t03=1:p03$=smb$+"  Arkturus ["+STR$(ROUND(s_d10,1))+"pc]":ENDIF
IF t03=-1: p03$="     Arkturus ["+STR$(ROUND(s_d10,1))+"pc]":ENDIF
IF t11=1:p11$=smb$+"  Capella ["+STR$(ROUND(s_d11,1))+"pc]":ENDIF
IF t11=-1: p11$="     Capella ["+STR$(ROUND(s_d11,1))+"pc]":ENDIF
IF t12=1:p12$=smb$+"  Rasalhague ["+STR$(ROUND(s_d12,1))+"pc]":ENDIF
IF t12=-1: p12$="     Rasalhague ["+STR$(ROUND(s_d12,1))+"pc]":ENDIF
IF t33=1:p33$=smb$+"  Alderamin ["+STR$(ROUND(s_d13,1))+"pc]":ENDIF
IF t33=-1: p33$="     Alderamin ["+STR$(ROUND(s_d13,1))+"pc]":ENDIF
IF t10=1:p10$=smb$+"  Castor ["+STR$(ROUND(s_d14,1))+"pc]":ENDIF
IF t10=-1: p10$="     Castor ["+STR$(ROUND(s_d14,1))+"pc]":ENDIF
IF t83=1:p83$=smb$+"  Caph ["+STR$(ROUND(s_d15,1))+"pc]":ENDIF
IF t83=-1: p83$="     Caph ["+STR$(ROUND(s_d15,1))+"pc]":ENDIF
IF t02=1:p02$=smb$+"  Aldebaran ["+STR$(ROUND(s_d16,1))+"pc]":ENDIF
IF t02=-1: p02$="     Aldebaran ["+STR$(ROUND(s_d16,1))+"pc]":  ENDIF
IF t84=1:p84$=smb$+"  Hamal ["+STR$(ROUND(s_d17,1))+"pc]":ENDIF
IF t84=-1: p84$="     Hamal ["+STR$(ROUND(s_d17,1))+"pc]":ENDIF
IF t85=1:p85$=smb$+"  Unuk ["+STR$(ROUND(s_d18,1))+"pc]":ENDIF
IF t85=-1: p85$="     Unuk ["+STR$(ROUND(s_d18,1))+"pc]":ENDIF
IF t86=1:p86$=smb$+"  Alphecca ["+STR$(ROUND(s_d19,1))+"pc]":ENDIF
IF t86=-1: p86$="     Alphecca ["+STR$(ROUND(s_d19,1))+"pc]":ENDIF
IF t13=1:p13$=smb$+"  Regulus ["+STR$(ROUND(s_d20,1))+"pc]":ENDIF
IF t13=-1: p13$="     Regulus ["+STR$(ROUND(s_d20,1))+"pc]":ENDIF
IF t87=1:p87$=smb$+"  Merak ["+STR$(ROUND(s_d21,1))+"pc]":ENDIF
IF t87=-1: p87$="     Merak ["+STR$(ROUND(s_d21,1))+"pc]":ENDIF
IF t88=1:p88$=smb$+"  Ankaa ["+STR$(ROUND(s_d22,1))+"pc]":ENDIF
```

```
IF t88=-1: p88$="     Ankaa ["+STR$(ROUND(s_d22,1))+"pc]":ENDIF
IF t89=1:p89$=smb$+"  Alioth ["+STR$(ROUND(s_d23,1))+"pc]":ENDIF
IF t89=-1: p89$="     Alioth ["+STR$(ROUND(s_d23,1))+"pc]":ENDIF
IF t90=1:p90$=smb$+"  Phecda ["+STR$(ROUND(s_d24,1))+"pc]":ENDIF
IF t90=-1: p90$="     Phecda ["+STR$(ROUND(s_d24,1))+"pc]":ENDIF
IF t91=1:p91$=smb$+"  Gacrux ["+STR$(ROUND(s_d25,1))+"pc]":ENDIF
IF t91=-1: p91$="     Gacrux ["+STR$(ROUND(s_d25,1))+"pc]":ENDIF
IF t14=1:p14$=smb$+"  Algol ["+STR$(ROUND(s_d26,1))+"pc]":ENDIF
IF t14=-1: p14$="     Algol ["+STR$(ROUND(s_d26,1))+"pc]":ENDIF
IF t92=1:p92$=smb$+"  Alpheratz ["+STR$(ROUND(s_d27,1))+"pc]":ENDIF
IF t92=-1: p92$="     Alpheratz ["+STR$(ROUND(s_d27,1))+"pc]":ENDIF
IF t93=1:p93$=smb$+"  Alnair ["+STR$(ROUND(s_d28,1))+"pc]":ENDIF
IF t93=-1: p93$="     Alnair ["+STR$(ROUND(s_d28,1))+"pc]":ENDIF
IF t94=1:p94$=smb$+"  Alhena ["+STR$(ROUND(s_d29,1))+"pc]":ENDIF
IF t94=-1: p94$="     Alhena ["+STR$(ROUND(s_d29,1))+"pc]":ENDIF
IF t95=1:p95$=smb$+"  Vindemiatrix ["+STR$(ROUND(s_d30,1))+"pc]":ENDIF
IF t95=-1: p95$="     Vindemiatrix ["+STR$(ROUND(s_d30,1))+"pc]":ENDIF
IF t96=1:p96$=smb$+"  Dubhe ["+STR$(ROUND(s_d31,1))+"pc]":ENDIF
IF t96=-1: p96$="     Dubhe ["+STR$(ROUND(s_d31,1))+"pc]":ENDIF
IF t97=1:p97$=smb$+"  Algieba ["+STR$(ROUND(s_d32,1))+"pc]":ENDIF
IF t97=-1: p97$="     Algieba ["+STR$(ROUND(s_d32,1))+"pc]":ENDIF
IF t100=1:p100$=smb$+"  Kochab ["+STR$(ROUND(s_d33,1))+"pc]":ENDIF
IF t100=-1: p100$="     Kochab ["+STR$(ROUND(s_d33,1))+"pc]":ENDIF
IF t101=1:p101$=smb$+"  Markab ["+STR$(ROUND(s_d34,1))+"pc]":ENDIF
IF t101=-1: p101$="     Markab ["+STR$(ROUND(s_d34,1))+"pc]":ENDIF
IF t102=1:p102$=smb$+"  Elnath ["+STR$(ROUND(s_d35,1))+"pc]":ENDIF
IF t102=-1: p102$="     Elnath ["+STR$(ROUND(s_d35,1))+"pc]":ENDIF
IF t103=1:p103$=smb$+"  Achernar ["+STR$(ROUND(s_d36,1))+"pc]":ENDIF
IF t103=-1: p103$="     Achernar ["+STR$(ROUND(s_d36,1))+"pc]":ENDIF
IF t104=1:p104$=smb$+"  Kaus Australis ["+STR$(ROUND(s_d37,1))+"pc]":ENDIF
IF t104=-1: p104$="     Kaus Australis ["+STR$(ROUND(s_d37,1))+"pc]":ENDIF
IF t105=1:p105$=smb$+"  Eltanin ["+STR$(ROUND(s_d38,1))+"pc]":ENDIF
IF t105=-1: p105$="     Eltanin ["+STR$(ROUND(s_d38,1))+"pc]":ENDIF
IF t106=1:p106$=smb$+"  Alphard ["+STR$(ROUND(s_d39,1))+"pc]":ENDIF
IF t106=-1: p106$="     Alphard ["+STR$(ROUND(s_d39,1))+"pc]":ENDIF
IF t107=1:p107$=smb$+"  Scheat ["+STR$(ROUND(s_d40,1))+"pc]":ENDIF
IF t107=-1: p107$="     Scheat ["+STR$(ROUND(s_d40,1))+"pc]":ENDIF
IF t108=1:p108$=smb$+"  Mirach ["+STR$(ROUND(s_d41,1))+"pc]":ENDIF
IF t108=-1: p108$="     Mirach ["+STR$(ROUND(s_d41,1))+"pc]":ENDIF
IF t109=1:p109$=smb$+"  Nunki ["+STR$(ROUND(s_d42,1))+"pc]":ENDIF
IF t109=-1: p109$="     Nunki ["+STR$(ROUND(s_d42,1))+"pc]":ENDIF
IF t110=1:p110$=smb$+"  Schedar ["+STR$(ROUND(s_d43,1))+"pc]":ENDIF
IF t110=-1: p110$="     Schedar ["+STR$(ROUND(s_d43,1))+"pc]":ENDIF
IF t111=1:p111$=smb$+"  Izar ["+STR$(ROUND(s_d44,1))+"pc]":ENDIF
IF t111=-1: p111$="     Izar ["+STR$(ROUND(s_d44,1))+"pc]":ENDIF
IF t112=1:p112$=smb$+"  Menkar ["+STR$(ROUND(s_d45,1))+"pc]":ENDIF
IF t112=-1: p112$="     Menkar ["+STR$(ROUND(s_d45,1))+"pc]":ENDIF
IF t113=1:p113$=smb$+"  Bellatrix ["+STR$(ROUND(s_d46,1))+"pc]":ENDIF
IF t113=-1: p113$="     Bellatrix ["+STR$(ROUND(s_d46,1))+"pc]":ENDIF
IF t32=1:p32$=smb$+"  Spica ["+STR$(ROUND(s_d47,1))+"pc]":ENDIF
IF t32=-1: p32$="     Spica ["+STR$(ROUND(s_d47,1))+"pc]":ENDIF
IF t114=1:p114$=smb$+"  Deneb Kaitos ["+STR$(ROUND(s_d48,1))+"pc]":ENDIF
IF t114=-1: p114$="     Deneb Kaitos ["+STR$(ROUND(s_d48,1))+"pc]":ENDIF
IF t115=1:p115$=smb$+"  Canopus ["+STR$(ROUND(s_d49,1))+"pc]":ENDIF
IF t115=-1: p115$="     Canopus ["+STR$(ROUND(s_d49,1))+"pc]":ENDIF
IF t116=1:p116$=smb$+"  Acrux ["+STR$(ROUND(s_d50,1))+"pc]":ENDIF
IF t116=-1: p116$="     Acrux ["+STR$(ROUND(s_d50,1))+"pc]":ENDIF
IF t117=1:p117$=smb$+"  Hadar ["+STR$(ROUND(s_d51,1))+"pc]":ENDIF
IF t117=-1: p117$="     Hadar ["+STR$(ROUND(s_d51,1))+"pc]":ENDIF
IF t118=1:p118$=smb$+"  Polaris ["+STR$(ROUND(s_d52,1))+"pc]":ENDIF
IF t118=-1: p118$="     Polaris ["+STR$(ROUND(s_d52,1))+"pc]":ENDIF
IF t15=1:p15$=smb$+"  Mira ["+STR$(ROUND(s_d53,1))+"pc]":ENDIF
IF t15=-1: p15$="     Mira ["+STR$(ROUND(s_d53,1))+"pc]":ENDIF
IF t119=1:p119$=smb$+"  Adhara ["+STR$(ROUND(s_d54,1))+"pc]":ENDIF
IF t119=-1: p119$="     Adhara ["+STR$(ROUND(s_d54,1))+"pc]":ENDIF
IF t120=1:p120$=smb$+"  Algenib ["+STR$(ROUND(s_d55,1))+"pc]":ENDIF
IF t120=-1: p120$="     Algenib ["+STR$(ROUND(s_d55,1))+"pc]":ENDIF
IF t121=1:p121$=smb$+"  Mirfak ["+STR$(ROUND(s_d56,1))+"pc]":ENDIF
IF t121=-1: p121$="     Mirfak ["+STR$(ROUND(s_d56,1))+"pc]":ENDIF
IF t17=1:p17$=smb$+"  Antares ["+STR$(ROUND(s_d57,1))+"pc]":ENDIF
IF t17=-1: p17$="     Antares ["+STR$(ROUND(s_d57,1))+"pc]":ENDIF
IF t122=1:p122$=smb$+"  Shaula ["+STR$(ROUND(s_d58,1))+"pc]":ENDIF
IF t122=-1: p122$="     Shaula ["+STR$(ROUND(s_d58,1))+"pc]":ENDIF
IF t18=1:p18$=smb$+"  Beteigeuze ["+STR$(ROUND(s_d59,1))+"pc]":ENDIF
IF t18=-1: p18$="     Beteigeuze ["+STR$(ROUND(s_d59,1))+"pc]":ENDIF
IF t123=1:p123$=smb$+"  Saiph ["+STR$(ROUND(s_d60,1))+"pc]":ENDIF
IF t123=-1: p123$="     Saiph ["+STR$(ROUND(s_d60,1))+"pc]":ENDIF
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IF t124=1:p124$=smb$+"  Enif ["+STR$(ROUND(s_d61,1))+"pc]":ENDIF
IF t124=-1: p124$="     Enif ["+STR$(ROUND(s_d61,1))+"pc]":ENDIF
IF t19=1:p19$=smb$+"  Rigel ["+STR$(ROUND(s_d62,1))+"pc]":ENDIF
IF t19=-1: p19$="     Rigel ["+STR$(ROUND(s_d62,1))+"pc]":ENDIF
IF t125=1:p125$=smb$+"  Mintaka ["+STR$(ROUND(s_d63,1))+"pc]":ENDIF
IF t125=-1: p125$="     Mintaka ["+STR$(ROUND(s_d63,1))+"pc]":ENDIF
IF t126=1:p126$=smb$+"  Alnitak ["+STR$(ROUND(s_d64,1))+"pc]":ENDIF
IF t126=-1: p126$="     Alnitak ["+STR$(ROUND(s_d64,1))+"pc]":ENDIF
IF t127=1:p127$=smb$+"  Alnilam ["+STR$(ROUND(s_d65,1))+"pc]":ENDIF
IF t127=-1: p127$="     Alnilam ["+STR$(ROUND(s_d65,1))+"pc]":ENDIF
IF t128=1:p128$=smb$+"  Arneb ["+STR$(ROUND(s_d66,1))+"pc]":ENDIF
IF t128=-1: p128$="     Arneb ["+STR$(ROUND(s_d66,1))+"pc]":ENDIF
IF t20=1:p20$=smb$+"  Deneb ["+STR$(ROUND(s_d67/1000,1))+"kpc]":ENDIF
IF t20=-1: p20$="     Deneb ["+STR$(ROUND(s_d67,1))+"pc]":ENDIF
IF t129=1:p129$=smb$+"  RSGC2-01 ["+STR$(ROUND(s_d68/1000,1))+"kpc]":ENDIF
IF t129=-1: p129$="     RSGC2-01 ["+STR$(ROUND(s_d68/1000,1))+"kpc]":ENDIF
IF t130=1:p130$=smb$+"  RSGC-F01 ["+STR$(ROUND(s_d69/1000,1))+"kpc]":ENDIF
IF t130=-1: p130$="     RSGC-F01 ["+STR$(ROUND(s_d69/1000,1))+"kpc]":ENDIF
!!
 IF t__=1:p__$=smb$+"  __ [__pc]":ENDIF
 IF t__=-1: p__$="     __ [__pc]":ENDIF
!!
s99$=smq$+"  Projektion an/aus"
s100$=smq$+"  Vergrößerung: "+INT$(vgr_s)+" ×"
IF s101=-1:s101$=_smbl$+"    Symbol":ENDIF
IF s101=1:s101$=_mst$+"    Maßstab × "+INT$(vgrs0):ENDIF
IF t06s=1:p06$=smb$+"  Text":ENDIF
IF t06s=-1:p06$="     Text aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
sreset:
IF s99=1
 t01=-1
 t02=-1
 t03=-1
 t05=-1
 t07=-1
 t08=-1
 t09=-1
 t10=-1
 t11=-1
 t12=-1
 t13=-1
 t14=-1
 t15=-1
 t17=-1
 t18=-1
 t19=-1
 t20=-1
 t32=-1
 t33=-1
 t35=-1
 t36=-1
 t38=-1
 t59=-1
 t73=-1
 t74=-1
 t75=-1
 t76=-1
 t77=-1
 t78=-1
 t79=-1
 t80=-1
 t81=-1
 t82=-1
 t83=-1
 t84=-1
 t85=-1
 t86=-1
 t87=-1
 t88=-1
 t89=-1
 t90=-1
 t91=-1
 t92=-1
 t93=-1
 t94=-1
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 t95=-1
 t96=-1
 t97=-1
 t100=-1
 t101=-1
 t102=-1
 t103=-1
 t104=-1
 t105=-1
 t106=-1
 t107=-1
 t108=-1
 t109=-1
 t110=-1
 t111=-1
 t112=-1
 t113=-1
 t114=-1
 t115=-1
 t116=-1
 t117=-1
 t118=-1
 t119=-1
 t120=-1
 t121=-1
 t122=-1
 t123=-1
 t124=-1
 t125=-1
 t126=-1
 t127=-1
 t128=-1
 t129=-1
 t130=-1
ELSE
 t01=1
 t02=1
 t03=1
 t05=1
 t07=1
 t08=1
 t09=1
 t10=1
 t11=1
 t12=1
 t13=1
 t14=1
 t15=1
 t17=1
 t18=1
 t19=1
 t20=1
 t32=1
 t33=1
 t35=1
 t36=1
 t38=1
 t73=1
 t74=1
 t75=1
 t76=1
 t77=1
 t78=1
 t79=1
 t80=1
 t81=1
 t82=1
 t83=1
 t84=1
 t85=1
 t86=1
 t87=1
 t88=1
 t89=1
 t90=1
 t91=1
 t92=1
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 t93=1
 t94=1
 t95=1
 t96=1
 t97=1
 t100=1
 t101=1
 t102=1
 t103=1
 t104=1
 t105=1
 t106=1
 t107=1
 t108=1
 t109=1
 t110=1
 t111=1
 t112=1
 t113=1
 t114=1
 t115=1
 t116=1
 t117=1
 t118=1
 t119=1
 t120=1
 t121=1
 t122=1
 t123=1
 t124=1
 t125=1
 t126=1
 t127=1
 t128=1
 t129=1
 t130=1
ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Dialog Stern- und Kugelsternhaufen %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog4prm:
st00=1
st01=-1
st02=-1
st03=-1
st04=-1
st05=-1
st06=-1
st07=-1
st08=-1
st09=-1
st10=-1
st11=-1
st12=-1
st13=-1
st14=-1
st15=-1
st16=-1
st17=-1
st18=-1
st19=-1
st20=-1
st21=-1
st22=-1
st23=-1
st24=-1
st25=-1
st26=-1
st27=-1
st28=-1
st29=-1
st30=-1
st31=-1
st32=-1
st33=-1
st34=-1
st35=-1
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st36=-1
st37=-1
st38=-1
st39=-1
st40=-1
st41=-1
st42=-1
st43=-1
st44=-1
st45=-1
st46=-1
st47=-1
st48=-1
st49=-1
st50=-1
st51=-1
st52=-1
st53=-1
st54=-1
st55=-1
st56=-1
st57=-1
st99=-1
st101=1 %%%
t06st=1
!!
 st__=-1
!!
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog4:
GOSUB menu4
std4:
ARRAY.LOAD
sel4$[],st00$,st01$,st14$,st02$,st03$,st04$,st05$,st06$,st15$,st16$,st17$,st18$,st19$
,st07$,st08$,st20$,st21$,st22$,st23$,st24$,st25$,st26$,st27$,st28$,st29$,st30$,st31$,
st32$,st09$,st33$,st34$,st35$,st36$,st10$,st37$,st38$,st39$,st40$,st41$,st11$,st42$,s
t43$,st44$,st45$,st46$,st47$,st48$,st49$,st50$,st51$,st52$,st53$,st54$,st55$,st12$,st
56$,st13$,st57$,st99$,st100$,st101$,st60$,"Ok"
DIALOG.SELECT    sel4,    sel4$[],"Offene    Sternhaufen    und    Kugelsternhaufen:
Darstellung/Projektion:"
IF sel4=1:st00=st00*-1:IF st00=-1 THEN RETURN:ENDIF
IF sel4=2:st01=st01*-1:ENDIF
IF sel4=3:st14=st14*-1:ENDIF
IF sel4=4:st02=st02*-1:ENDIF
IF sel4=5:st03=st03*-1:ENDIF
IF sel4=6:st04=st04*-1:ENDIF
IF sel4=7:st05=st05*-1:ENDIF
IF sel4=8:st06=st06*-1:ENDIF
IF sel4=9:st15=st15*-1:ENDIF
IF sel4=10:st16=st16*-1:ENDIF
IF sel4=11:st17=st17*-1:ENDIF
IF sel4=12:st18=st18*-1:ENDIF
IF sel4=13:st19=st19*-1:ENDIF
IF sel4=14:st07=st07*-1:ENDIF
IF sel4=15:st08=st08*-1:ENDIF
IF sel4=16:st20=st20*-1:ENDIF
IF sel4=17:st21=st21*-1:ENDIF
IF sel4=18:st22=st22*-1:ENDIF
IF sel4=19:st23=st23*-1:ENDIF
IF sel4=20:st24=st24*-1:ENDIF
IF sel4=21:st25=st25*-1:ENDIF
IF sel4=22:st26=st26*-1:ENDIF
IF sel4=23:st27=st27*-1:ENDIF
IF sel4=24:st28=st28*-1:ENDIF
IF sel4=25:st29=st29*-1:ENDIF
IF sel4=26:st30=st30*-1:ENDIF
IF sel4=27:st31=st31*-1:ENDIF
IF sel4=28:st32=st32*-1:ENDIF
IF sel4=29:st09=st09*-1:ENDIF
IF sel4=30:st33=st33*-1:ENDIF
IF sel4=31:st34=st34*-1:ENDIF
IF sel4=32:st35=st35*-1:ENDIF
IF sel4=33:st36=st36*-1:ENDIF
IF sel4=34:st10=st10*-1:ENDIF
IF sel4=35:st37=st37*-1:ENDIF
IF sel4=36:st38=st38*-1:ENDIF
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IF sel4=37:st39=st39*-1:ENDIF
IF sel4=38:st40=st40*-1:ENDIF
IF sel4=39:st41=st41*-1:ENDIF
IF sel4=40:st11=st11*-1:ENDIF
IF sel4=41:st42=st42*-1:ENDIF
IF sel4=42:st43=st43*-1:ENDIF
IF sel4=43:st44=st44*-1:ENDIF
IF sel4=44:st45=st45*-1:ENDIF
IF sel4=45:st46=st46*-1:ENDIF
IF sel4=46:st47=st47*-1:ENDIF
IF sel4=47:st48=st48*-1:ENDIF
IF sel4=48:st49=st49*-1:ENDIF
IF sel4=49:st50=st50*-1:ENDIF
IF sel4=50:st51=st51*-1:ENDIF
IF sel4=51:st52=st52*-1:ENDIF
IF sel4=52:st53=st53*-1:ENDIF
IF sel4=53:st54=st54*-1:ENDIF
IF sel4=54:st55=st55*-1:ENDIF
IF sel4=55:st12=st12*-1:ENDIF
IF sel4=56:st56=st56*-1:ENDIF
IF sel4=57:st57=st57*-1:ENDIF
IF sel4=58:st13=st13*-1:ENDIF
!!
 IF sel4=_:st__=st__*-1:ENDIF
!!
IF sel4=59:GOSUB streset: st99=st99*-1:ENDIF
IF sel4=60
 GOSUB dlgvgr
 vgr_st=_vgr:vgr=vgr_st
ENDIF
IF sel4=61:st101=st101*-1:ENDIF
IF sel4=62:t06st=t06st*-1:ENDIF
IF sel4=63:RETURN:ENDIF
GOSUB menu4
GOTO std4
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu4:
IF st00=1:st00$=smb$+"  Ebene an":ENDIF
IF st00=-1: st00$="     Ebene aus":ENDIF
IF st01=1:st01$=smb$+"  Plejaden ["+STR$(ROUND(st_d01,1))+"pc]":ENDIF
IF st01=-1: st01$="     Plejaden ["+STR$(ROUND(st_d01,1))+"pc]":ENDIF
IF st14=1:st14$=smb$+"  Winnecke 4 ["+STR$(ROUND(st_d02,1))+"pc]":ENDIF
IF st14=-1: st14$="     Winnecke 4 ["+STR$(ROUND(st_d02,1))+"pc]":ENDIF
IF st02=1:st02$=smb$+"  Praesepe ["+STR$(ROUND(st_d03,1))+"pc]":ENDIF
IF st02=-1: st02$="     Praesepe ["+STR$(ROUND(st_d03,1))+"pc]":ENDIF
IF st03=1:st03$=smb$+"  Ptolemaeus ["+STR$(ROUND(st_d04,1))+"pc]":ENDIF
IF st03=-1: st03$="     Ptolemaeus ["+STR$(ROUND(st_d04,1))+"pc]":ENDIF
IF st04=1:st04$=smb$+"  M39 ["+STR$(ROUND(st_d05,1))+"pc]":ENDIF
IF st04=-1: st04$="     M39 ["+STR$(ROUND(st_d05,1))+"pc]":ENDIF
IF st05=1:st05$=smb$+"  M34 ["+STR$(ROUND(st_d06,1))+"pc]":ENDIF
IF st05=-1: st05$="     M34 ["+STR$(ROUND(st_d06,1))+"pc]":ENDIF
IF st06=1:st06$=smb$+"  M6 ["+STR$(ROUND(st_d07,1))+"pc]":ENDIF
IF st06=-1: st06$="     M6 ["+STR$(ROUND(st_d07,1))+"pc]":ENDIF
IF st15=1:st15$=smb$+"  M47 ["+STR$(ROUND(st_d08,1))+"pc]":ENDIF
IF st15=-1: st15$="     M47 ["+STR$(ROUND(st_d08,1))+"pc]":ENDIF
IF st16=1:st16$=smb$+"  M23 ["+STR$(ROUND(st_d09,1))+"pc]":ENDIF
IF st16=-1: st16$="     M23 ["+STR$(ROUND(st_d09,1))+"pc]":ENDIF
IF st17=1:st17$=smb$+"  M25 ["+STR$(ROUND(st_d10,1))+"pc]":ENDIF
IF st17=-1: st17$="     M25 ["+STR$(ROUND(st_d10,1))+"pc]":ENDIF
IF st18=1:st18$=smb$+"  M41 ["+STR$(ROUND(st_d11,1))+"pc]":ENDIF
IF st18=-1: st18$="     M41 ["+STR$(ROUND(st_d11,1))+"pc]":ENDIF
IF st19=1:st19$=smb$+"  M73 ["+STR$(ROUND(st_d12,1))+"pc]":ENDIF
IF st19=-1: st19$="     M73 ["+STR$(ROUND(st_d12,1))+"pc]":ENDIF
IF st07=1:st07$=smb$+"  M48 ["+STR$(ROUND(st_d13,1))+"pc]":ENDIF
IF st07=-1: st07$="     M48 ["+STR$(ROUND(st_d13,1))+"pc]":ENDIF
IF st08=1:st08$=smb$+"  M67 ["+STR$(ROUND(st_d14,1))+"pc]":ENDIF
IF st08=-1: st08$="     M67 ["+STR$(ROUND(st_d14,1))+"pc]":ENDIF
IF st20=1:st20$=smb$+"  M50 ["+STR$(ROUND(st_d15,1))+"pc]":ENDIF
IF st20=-1: st20$="     M50 ["+STR$(ROUND(st_d15,1))+"pc]":ENDIF
IF st21=1:st21$=smb$+"  M35 ["+STR$(ROUND(st_d16,1))+"pc]":ENDIF
IF st21=-1: st21$="     M35 ["+STR$(ROUND(st_d16,1))+"pc]":ENDIF
IF st22=1:st22$=smb$+"  M93 ["+STR$(ROUND(st_d17/10^3,1))+"kpc]":ENDIF
IF st22=-1: st22$="     M93 ["+STR$(ROUND(st_d17/10^3,1))+"kpc]":ENDIF
IF st23=1:st23$=smb$+"  M38 ["+STR$(ROUND(st_d18/10^3,1))+"kpc]":ENDIF
IF st23=-1: st23$="     M38 ["+STR$(ROUND(st_d18/10^3,1))+"kpc]":ENDIF
IF st24=1:st24$=smb$+"  M29 ["+STR$(ROUND(st_d19/10^3,1))+"kpc]":ENDIF
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IF st24=-1: st24$="     M29 ["+STR$(ROUND(st_d19/10^3,1))+"kpc]":ENDIF
IF st25=1:st25$=smb$+"  M36 ["+STR$(ROUND(st_d20/10^3,1))+"kpc]":ENDIF
IF st25=-1: st25$="     M36 ["+STR$(ROUND(st_d20/10^3,1))+"kpc]":ENDIF
IF st26=1:st26$=smb$+"  M18 ["+STR$(ROUND(st_d21/10^3,1))+"kpc]":ENDIF
IF st26=-1: st26$="     M18 ["+STR$(ROUND(st_d21/10^3,1))+"kpc]":ENDIF
IF st28=1:st28$=smb$+"  M21 ["+STR$(ROUND(st_d23/10^3,1))+"kpc]":ENDIF
IF st28=-1: st28$="     M21 ["+STR$(ROUND(st_d23/10^3,1))+"kpc]":ENDIF
IF st27=1:st27$=smb$+"  M37 ["+STR$(ROUND(st_d22/10^3,1))+"kpc]":ENDIF
IF st27=-1: st27$="     M37 ["+STR$(ROUND(st_d22/10^3,1))+"kpc]":ENDIF
IF st29=1:st29$=smb$+"  M52 ["+STR$(ROUND(st_d24/10^3,1))+"kpc]":ENDIF
IF st29=-1: st29$="     M52 ["+STR$(ROUND(st_d24/10^3,1))+"kpc]":ENDIF
IF st30=1:st30$=smb$+"  M46 ["+STR$(ROUND(st_d25/10^3,1))+"kpc]":ENDIF
IF st30=-1: st30$="     M46 ["+STR$(ROUND(st_d25/10^3,1))+"kpc]":ENDIF
IF st31=1:st31$=smb$+"  M26 ["+STR$(ROUND(st_d26/10^3,1))+"kpc]":ENDIF
IF st31=-1: st31$="     M26 ["+STR$(ROUND(st_d26/10^3,1))+"kpc]":ENDIF
IF st32=1:st32$=smb$+"  Wildenten ["+STR$(ROUND(st_d27/10^3,1))+"kpc]":ENDIF
IF st32=-1: st32$="     Wildenten ["+STR$(ROUND(st_d27/10^3,1))+"kpc]":ENDIF
IF st09=1:st09$=smb$+"  M4 ["+STR$(ROUND(st_d28/10^3,1))+"kpc]":ENDIF
IF st09=-1: st09$="     M4 ["+STR$(ROUND(st_d28/10^3,1))+"kpc]":ENDIF
IF st33=1:st33$=smb$+"  M103 ["+STR$(ROUND(st_d29/10^3,1))+"kpc]":ENDIF
IF st33=-1: st33$="     M103 ["+STR$(ROUND(st_d29/10^3,1))+"kpc]":ENDIF
IF st34=1:st34$=smb$+"  M22 ["+STR$(ROUND(st_d30/10^3,1))+"kpc]":ENDIF
IF st34=-1: st34$="     M22 ["+STR$(ROUND(st_d30/10^3,1))+"kpc]":ENDIF
IF st35=1:st35$=smb$+"  M71 ["+STR$(ROUND(st_d31/10^3,1))+"kpc]":ENDIF
IF st35=-1: st35$="     M71 ["+STR$(ROUND(st_d31/10^3,1))+"kpc]":ENDIF
IF st36=1:st36$=smb$+"  M10 ["+STR$(ROUND(st_d32/10^3,1))+"kpc]":ENDIF
IF st36=-1: st36$="     M10 ["+STR$(ROUND(st_d32/10^3,1))+"kpc]":ENDIF
IF st10=1:st10$=smb$+"  "+_go$+" Haufen ["+STR$(ROUND(st_d33/10^3,1))+"kpc]":ENDIF
IF st10=-1: st10$="     "+_go$+" Haufen ["+STR$(ROUND(st_d33/10^3,1))+"kpc]":ENDIF
IF st37=1:st37$=smb$+"  M12 ["+STR$(ROUND(st_d34/10^3,1))+"kpc]":ENDIF
IF st37=-1: st37$="     M12 ["+STR$(ROUND(st_d34/10^3,1))+"kpc]":ENDIF
IF st38=1:st38$=smb$+"  M55 ["+STR$(ROUND(st_d35/10^3,1))+"kpc]":ENDIF
IF st38=-1: st38$="     M55 ["+STR$(ROUND(st_d35/10^3,1))+"kpc]":ENDIF
IF st39=1:st39$=smb$+"  M28 ["+STR$(ROUND(st_d36/10^3,1))+"kpc]":ENDIF
IF st39=-1: st39$="     M28 ["+STR$(ROUND(st_d36/10^3,1))+"kpc]":ENDIF
IF st40=1:st40$=smb$+"  M107 ["+STR$(ROUND(st_d37/10^3,1))+"kpc]":ENDIF
IF st40=-1: st40$="     M107 ["+STR$(ROUND(st_d37/10^3,1))+"kpc]":ENDIF
IF st41=1:st41$=smb$+"  M62 ["+STR$(ROUND(st_d38/10^3,1))+"kpc]":ENDIF
IF st41=-1: st41$="     M62 ["+STR$(ROUND(st_d38/10^3,1))+"kpc]":ENDIF
IF st11=1:st11$=smb$+"  M13 ["+STR$(ROUND(st_d39/10^3,1))+"kpc]":ENDIF
IF st11=-1: st11$="     M13 ["+STR$(ROUND(st_d39/10^3,1))+"kpc]":ENDIF
IF st42=1:st42$=smb$+"  M5 ["+STR$(ROUND(st_d40/10^3,1))+"kpc]":ENDIF
IF st42=-1: st42$="     M5 ["+STR$(ROUND(st_d40/10^3,1))+"kpc]":ENDIF
IF st43=1:st43$=smb$+"  M9 ["+STR$(ROUND(st_d41/10^3,1))+"kpc]":ENDIF
IF st43=-1: st43$="     M9 ["+STR$(ROUND(st_d41/10^3,1))+"kpc]":ENDIF
IF st44=1:st44$=smb$+"  M92 ["+STR$(ROUND(st_d42/10^3,1))+"kpc]":ENDIF
IF st44=-1: st44$="     M92 ["+STR$(ROUND(st_d42/10^3,1))+"kpc]":ENDIF
IF st45=1:st45$=smb$+"  M30 ["+STR$(ROUND(st_d43/10^3,1))+"kpc]":ENDIF
IF st45=-1: st45$="     M30 ["+STR$(ROUND(st_d43/10^3,1))+"kpc]":ENDIF
IF st46=1:st46$=smb$+"  M19 ["+STR$(ROUND(st_d44/10^3,1))+"kpc]":ENDIF
IF st46=-1: st46$="     M19 ["+STR$(ROUND(st_d44/10^3,1))+"kpc]":ENDIF
IF st47=1:st47$=smb$+"  M69 ["+STR$(ROUND(st_d45/10^3,1))+"kpc]":ENDIF
IF st47=-1: st47$="     M69 ["+STR$(ROUND(st_d45/10^3,1))+"kpc]":ENDIF
IF st48=1:st48$=smb$+"  M70 ["+STR$(ROUND(st_d46/10^3,1))+"kpc]":ENDIF
IF st48=-1: st48$="     M70 ["+STR$(ROUND(st_d46/10^3,1))+"kpc]":ENDIF
IF st49=1:st49$=smb$+"  M14 ["+STR$(ROUND(st_d47/10^3,1))+"kpc]":ENDIF
IF st49=-1: st49$="     M14 ["+STR$(ROUND(st_d47/10^3,1))+"kpc]":ENDIF
IF st50=1:st50$=smb$+"  M80 ["+STR$(ROUND(st_d48/10^3,1))+"kpc]":ENDIF
IF st50=-1: st50$="     M80 ["+STR$(ROUND(st_d48/10^3,1))+"kpc]":ENDIF
IF st51=1:st51$=smb$+"  M56 ["+STR$(ROUND(st_d49/10^3,1))+"kpc]":ENDIF
IF st51=-1: st51$="     M56 ["+STR$(ROUND(st_d49/10^3,1))+"kpc]":ENDIF
IF st52=1:st52$=smb$+"  M2 ["+STR$(ROUND(st_d50/10^3,1))+"kpc]":ENDIF
IF st52=-1: st52$="     M2 ["+STR$(ROUND(st_d50/10^3,1))+"kpc]":ENDIF
IF st53=1:st53$=smb$+"  M68 ["+STR$(ROUND(st_d51/10^3,1))+"kpc]":ENDIF
IF st53=-1: st53$="     M68 ["+STR$(ROUND(st_d51/10^3,1))+"kpc]":ENDIF
IF st54=1:st54$=smb$+"  M3 ["+STR$(ROUND(st_d52/10^3,1))+"kpc]":ENDIF
IF st54=-1: st54$="     M3 ["+STR$(ROUND(st_d52/10^3,1))+"kpc]":ENDIF
IF st55=1:st55$=smb$+"  M15 ["+STR$(ROUND(st_d53/10^3,1))+"kpc]":ENDIF
IF st55=-1: st55$="     M15 ["+STR$(ROUND(st_d53/10^3,1))+"kpc]":ENDIF
IF st12=1:st12$=smb$+"  M79 ["+STR$(ROUND(st_d54/10^3,1))+"kpc]":ENDIF
IF st12=-1: st12$="     M79 ["+STR$(ROUND(st_d54/10^3,1))+"kpc]":ENDIF
IF st56=1:st56$=smb$+"  M72 ["+STR$(ROUND(st_d55/10^3,1))+"kpc]":ENDIF
IF st56=-1: st56$="     M72 ["+STR$(ROUND(st_d55/10^3,1))+"kpc]":ENDIF
IF st57=1:st57$=smb$+"  M75 ["+STR$(ROUND(st_d57/10^3,1))+"kpc]":ENDIF
IF st57=-1: st57$="     M75 ["+STR$(ROUND(st_d57/10^3,1))+"kpc]":ENDIF
IF st13=1:st13$=smb$+"  M53 ["+STR$(ROUND(st_d56/10^3,1))+"kpc]":ENDIF
IF st13=-1: st13$="     M53 ["+STR$(ROUND(st_d56/10^3,1))+"kpc]":ENDIF
```

```
!!
 IF st__=1:st__$=smb$+"  __ [__pc]":ENDIF
 IF st__=-1: st__$="     __ [__pc]":ENDIF
!!
st99$=smq$+"  Projektion an/aus"
st100$=smq$+"  Vergrößerung: "+INT$(vgr_st)+" ×"
IF st101=-1:st101$=_smbl$+"    Symbol":ENDIF
IF st101=1:st101$=_mst$+"    Maßstab":ENDIF
IF t06st=1:st60$=smb$+"  Text":ENDIF
IF t06st=-1:st60$="     Text aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
streset:
IF st99=1
 st01=-1
 st02=-1
 st03=-1
 st04=-1
 st05=-1
 st06=-1
 st07=-1
 st08=-1
 st09=-1
 st10=-1
 st11=-1
 st12=-1
 st13=-1
 st14=-1
 st15=-1
 st16=-1
 st17=-1
 st18=-1
 st19=-1
 st20=-1
 st21=-1
 st22=-1
 st23=-1
 st24=-1
 st25=-1
 st26=-1
 st27=-1
 st28=-1
 st29=-1
 st30=-1
 st31=-1
 st32=-1
 st33=-1
 st34=-1
 st35=-1
 st36=-1
 st37=-1
 st38=-1
 st39=-1
 st40=-1
 st41=-1
 st42=-1
 st43=-1
 st44=-1
 st45=-1
 st46=-1
 st47=-1
 st48=-1
 st49=-1
 st50=-1
 st51=-1
 st52=-1
 st53=-1
 st54=-1
 st55=-1
 st56=-1
 st57=-1
ELSE
 st01=1
 st02=1
 st03=1
 st04=1
 st05=1
```

```
 st06=1
 st07=1
 st08=1
 st09=1
 st10=1
 st11=1
 st12=1
 st13=1
 st14=1
 st15=1
 st16=1
 st17=1
 st18=1
 st19=1
 st20=1
 st21=1
 st22=1
 st23=1
 st24=1
 st25=1
 st26=1
 st27=1
 st28=1
 st29=1
 st30=1
 st31=1
 st32=1
 st33=1
 st34=1
 st35=1
 st36=1
 st37=1
 st38=1
 st39=1
 st40=1
 st41=1
 st42=1
 st43=1
 st44=1
 st45=1
 st46=1
 st47=1
 st48=1
 st49=1
 st50=1
 st51=1
 st52=1
 st53=1
 st54=1
 st55=1
 st56=1
 st57=1
ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Dialog Nebel %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog5prm:
nb00=1
nb01=-1
nb02=-1
nb10=-1
nb11=-1
nb12=-1
nb14=-1
nb15=-1
nb16=-1
nb17=-1
nb18=-1
nb19=-1
nb20=-1
nb21=-1
nb22=-1
nb101=1 %%%%
nb99=-1
t06nb=1
!!
 nb  =-1
```

```
!!
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog5:
GOSUB menu5
std5:
ARRAY.LOAD sel5$[],nb00$,nb15$,nb01$,nb16$,nb17$,nb18$,
nb19$,nb20$,nb21$,nb22$,nb10$,nb11$,nb12$,nb14$,nb99$,nb100$,nb101$,nb23$,"Ok"
DIALOG.SELECT sel5, sel5$[],"Nebel, Planetare Nebel und Supernovae:
Darstellung/Projektion:"
IF sel5=1:nb00=nb00*-1:IF nb00=-1 THEN RETURN:ENDIF
IF sel5=2:nb15=nb15*-1:ENDIF
IF sel5=3:nb01=nb01*-1:ENDIF
IF sel5=4:nb16=nb16*-1:ENDIF
IF sel5=5:nb17=nb17*-1:ENDIF
IF sel5=6:nb18=nb18*-1:ENDIF
IF sel5=7:nb19=nb19*-1:ENDIF
IF sel5=8:nb20=nb20*-1:ENDIF
IF sel5=9:nb21=nb21*-1:ENDIF
IF sel5=10:nb22=nb22*-1:ENDIF
IF sel5=11:nb10=nb10*-1:ENDIF
IF sel5=12:nb11=nb11*-1:ENDIF
IF sel5=13:nb12=nb12*-1:ENDIF
IF sel5=14:nb14=nb14*-1:ENDIF
!!
 IF sel5=__:nb__=nb__*-1:ENDIF
!!
IF sel5=15:GOSUB nbreset: nb99=nb99*-1:ENDIF
IF sel5=16
 GOSUB dlgvgr
 vgr_nb=_vgr:vgr=vgr_nb
ENDIF
IF sel5=17:nb101=nb101*-1:ENDIF
IF sel5=18:t06nb=t06nb*-1:ENDIF
IF sel5=19:RETURN:ENDIF
GOSUB menu5
GOTO std5
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu5:
IF nb00=1:nb00$=smb$+"  Ebene an":ENDIF
IF nb00=-1: nb00$="     Ebene aus":ENDIF
IF nb15=1:nb15$=smb$+"  Hantelnebel ["+STR$(ROUND(nb_d01,1))+"pc]":ENDIF
IF nb15=-1: nb15$="     Hantelnebel ["+STR$(ROUND(nb_d01,1))+"pc]":ENDIF
IF nb01=1:nb01$=smb$+"  Orionnebel ["+STR$(ROUND(nb_d02,1))+"pc]":ENDIF
IF nb01=-1: nb01$="     Orionnebel ["+STR$(ROUND(nb_d02,1))+"pc]":ENDIF
IF nb16=1:nb16$=smb$+"  M78 ["+STR$(ROUND(nb_d03,1))+"pc]":ENDIF
IF nb16=-1: nb16$="     M78 ["+STR$(ROUND(nb_d03,1))+"pc]":ENDIF
IF nb17=1:nb17$=smb$+"  Eulennebel ["+STR$(ROUND(nb_d04,1))+"pc]":ENDIF
IF nb17=-1: nb17$="     Eulennebel ["+STR$(ROUND(nb_d04,1))+"pc]":ENDIF
IF nb18=1:nb18$=smb$+"  M76 ["+STR$(ROUND(nb_d05,1))+"pc]":ENDIF
IF nb18=-1: nb18$="     M76 ["+STR$(ROUND(nb_d05,1))+"pc]":ENDIF
IF nb19=1:nb19$=smb$+"  Ringnebel ["+STR$(ROUND(nb_d06,1))+"pc]":ENDIF
IF nb19=-1: nb19$="     Ringnebel ["+STR$(ROUND(nb_d06,1))+"pc]":ENDIF
IF nb20=1:nb20$=smb$+"  Lagunennebel ["+STR$(ROUND(nb_d07/1000,1))+"kpc]":ENDIF
IF nb20=-1: nb20$="     Lagunennebel ["+STR$(ROUND(nb_d07/1000,1))+"kpc]":ENDIF
IF nb21=1:nb21$=smb$+"  Trifidnebel ["+STR$(ROUND(nb_d08/1000,1))+"kpc]":ENDIF
IF nb21=-1: nb21$="     Trifidnebel ["+STR$(ROUND(nb_d08/1000,1))+"kpc]":ENDIF
IF nb22=1:nb22$=smb$+"  Omeganebel ["+STR$(ROUND(nb_d09/1000,1))+"kpc]":ENDIF
IF nb22=-1: nb22$="     Omeganebel ["+STR$(ROUND(nb_d09/1000,1))+"kpc]":ENDIF
IF nb10=1:nb10$=smb$+"  Krebsnebel ["+STR$(ROUND(nb_d10/1000,1))+"kpc]":ENDIF
IF nb10=-1: nb10$="     Krebsnebel ["+STR$(ROUND(nb_d10/1000,1))+"kpc]":ENDIF
IF nb11=1:nb11$=smb$+"  Adlernebel ["+STR$(ROUND(nb_d11/1000,1))+"kpc]":ENDIF
IF nb11=-1: nb11$="     Adlernebel ["+STR$(ROUND(nb_d11/1000,1))+"kpc]":ENDIF
IF nb12=1:nb12$=smb$+"  Stundenglasnebel ["+STR$(ROUND(nb_d12/1000,1))+"kpc]":ENDIF
IF nb12=-1: nb12$="     Stundenglasnebel ["+STR$(ROUND(nb_d12/1000,1))+"kpc]":ENDIF
IF nb14=1:nb14$=smb$+"  V838 ["+STR$(ROUND(nb_d13/1000,1))+"kpc]":ENDIF
IF nb14=-1: nb14$="     V838 ["+STR$(ROUND(nb_d13/1000,1))+"kpc]":ENDIF
!!
 IF nb__=1:nb__$=smb$+"   __ [__pc]":ENDIF
 IF nb__=-1: nb__$="      __ [__pc]":ENDIF
!!
nb99$=smq$+"  Projektion an/aus"
nb100$=smq$+"  Vergrößerung: "+INT$(vgr_nb)+" ×"
IF nb101=-1:nb101$=_smbl$+"    Symbol":ENDIF
IF nb101=1:nb101$=_mst$+"    Maßstab":ENDIF
IF t06nb=1:nb23$=smb$+"  Text":ENDIF
```

```
IF t06nb=-1:nb23$="     Text aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
nbreset:
IF nb99=1
 nb01=-1
 nb02=-1
 nb10=-1
 nb11=-1
 nb12=-1
 nb14=-1
 nb15=-1
 nb16=-1
 nb17=-1
 nb18=-1
 nb19=-1
 nb20=-1
 nb21=-1
 nb22=-1
ELSE
 nb01=1
 nb02=1
 nb10=1
 nb11=1
 nb12=1
 nb14=1
 nb15=1
 nb16=1
 nb17=1
 nb18=1
 nb19=1
 nb20=1
 nb21=1
 nb22=1
ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Dialog Milchstraße %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog6prm:
gm00=1
gm01=-1
gm02=-1
gm03=-1
gm04=-1
gm05=-1
gm06=-1
gm99=-1
t06gm=1
!!
 gm__=-1
!!
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog6:
GOSUB menu6
std6:
ARRAY.LOAD sel6$[],gm00$,gm05$,gm06$,gm01$,gm02$,gm04$,gm03$,gm99$,gm30$,"Ok"
DIALOG.SELECT sel6, sel6$[],"Milchstraßen Objekte: Darstellung/Projektion:"
IF sel6=1:gm00=gm00*-1:IF gm00=-1 THEN RETURN:ENDIF
IF sel6=2:gm05=gm05*-1:ENDIF
IF sel6=3:gm06=gm06*-1:ENDIF
IF sel6=4:gm01=gm01*-1:ENDIF
IF sel6=5:gm02=gm02*-1:ENDIF
IF sel6=6:gm04=gm04*-1:ENDIF
IF sel6=7:gm03=gm03*-1:ENDIF
!!
 IF sel6=__:gm__=gm__*-1:ENDIF
!!
IF sel6=8:GOSUB gmreset: gm99=gm99*-1:ENDIF
!!
IF sel6=9
 GOSUB dlgvgr
 vgr_gm=_vgr:vgr=vgr_gm
ENDIF
!!
IF sel6=9:t06gm=t06gm*-1:ENDIF
IF sel6=10:RETURN:ENDIF
```

```
GOSUB menu6
GOTO std6
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu6:
IF gm00=1:gm00$=smb$+"  Ebene an":ENDIF
IF gm00=-1: gm00$="     Ebene aus":ENDIF
IF gm05=1:gm05$=smb$+"   Sagittarius Wolke ["+STR$(ROUND(gm_d02/1000,1))+"kpc]":ENDIF
IF gm05=-1: gm05$="      Sagittarius Wolke ["+STR$(ROUND(gm_d02/1000,1))+"kpc]":ENDIF
IF gm06=1:gm06$=smb$+"   Zentrum ["+STR$(ROUND(gm_d01/1000,1))+"kpc]":ENDIF
IF gm06=-1: gm06$="      Zentrum ["+STR$(ROUND(gm_d01/1000,1))+"kpc]":ENDIF
IF gm01=1:gm01$=smb$+"   Sag DEG ["+STR$(ROUND(gm_d03/1000,1))+"kpc]":ENDIF
IF gm01=-1: gm01$="      Sag DEG ["+STR$(ROUND(gm_d03/1000,1))+"kpc]":ENDIF
IF gm02=1:gm02$=smb$+"   M54 ["+STR$(ROUND(gm_d04/1000,1))+"kpc]":ENDIF
IF gm02=-1: gm02$="      M54 ["+STR$(ROUND(gm_d04/1000,1))+"kpc]":ENDIF
IF gm03=1:gm03$=smb$+"   Große Wolke ["+STR$(ROUND(gm_d05/1000,1))+"kpc]":ENDIF
IF gm03=-1: gm03$="      Große Wolke ["+STR$(ROUND(gm_d05/1000,1))+"kpc]":ENDIF
IF gm04=1:gm04$=smb$+"   Kleine Wolke ["+STR$(ROUND(gm_d06/1000,1))+"kpc]":ENDIF
IF gm04=-1: gm04$="      Kleine Wolke ["+STR$(ROUND(gm_d06/1000,1))+"kpc]":ENDIF
!!
 IF gm__=1:gm__$=smb$+"      [__kpc]":ENDIF
 IF gm__=-1: gm__$="         [__kpc]":ENDIF
!!
gm99$=smq$+"  Projektion an/aus"
!gm100$=smq$+"  Vergrößerung: "+INT$(vgr_gm)+" ×"
IF t06gm=1:gm30$=smb$+"  Text":ENDIF
IF t06gm=-1:gm30$="     Text aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
gmreset:
IF gm99=1
 gm01=-1
 gm02=-1
 gm03=-1
 gm04=-1
 gm05=-1
 gm06=-1
ELSE
 gm01=1
 gm02=1
 gm03=1
 gm04=1
 gm05=1
 gm06=1
ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Dialog Galaxien %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog7prm:
gx00=1
gx01=-1
gx02=-1
gx03=-1
gx04=-1
gx05=-1
gx06=-1
gx07=-1
gx08=-1
gx09=-1
gx10=-1
gx11=-1
gx12=-1
gx13=-1
gx14=-1
gx15=-1
gx16=-1
gx17=-1
gx18=-1
gx19=-1
gx20=-1
gx21=-1
gx22=-1
gx23=-1
gx24=-1
gx25=-1
gx26=-1
gx27=-1
```

```
gx28=-1
gx29=-1
gx30=-1
gx31=-1
gx99=-1
gx101=1 %%%
t06gx=1
!!
 gx__=-1
!!
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog7:
GOSUB menu7
std7:
ARRAY.LOAD
sel7$[],gx00$,gx01$,gx05$,gx11$,gx12$,gx20$,gx13$,gx02$,gx27$,gx03$,gx21$,gx04$,gx10$
,gx29$,gx22$,gx28$,gx14$,gx23$,gx31$,gx15$,gx26$,gx30$,gx17$,gx19$,gx07$,gx06$,gx16$,
gx09$,gx08$,gx25$,gx18$,gx24$,gx99$,gx100$,gx101$,gx40$,"Ok"
DIALOG.SELECT sel7, sel7$[],"Galaxien: Darstellung/Projektion:"
IF sel7=1:gx00=gx00*-1:IF gx00=-1 THEN RETURN:ENDIF
IF sel7=2:gx01=gx01*-1:ENDIF
IF sel7=3:gx05=gx05*-1:ENDIF
IF sel7=4:gx11=gx11*-1:ENDIF
IF sel7=5:gx12=gx12*-1:ENDIF
IF sel7=6:gx20=gx20*-1:ENDIF
IF sel7=7:gx13=gx13*-1:ENDIF
IF sel7=8:gx02=gx02*-1:ENDIF
IF sel7=9:gx27=gx27*-1:ENDIF
IF sel7=10:gx03=gx03*-1:ENDIF
IF sel7=11:gx21=gx21*-1:ENDIF
IF sel7=12:gx04=gx04*-1:ENDIF
IF sel7=13:gx10=gx10*-1:ENDIF
IF sel7=14:gx29=gx29*-1:ENDIF
IF sel7=15:gx22=gx22*-1:ENDIF
IF sel7=16:gx28=gx28*-1:ENDIF
IF sel7=17:gx14=gx14*-1:ENDIF
IF sel7=18:gx23=gx23*-1:ENDIF
IF sel7=19:gx31=gx31*-1:ENDIF
IF sel7=20:gx15=gx15*-1:ENDIF
IF sel7=21:gx26=gx26*-1:ENDIF
IF sel7=22:gx30=gx30*-1:ENDIF
IF sel7=23:gx17=gx17*-1:ENDIF
IF sel7=24:gx19=gx19*-1:ENDIF
IF sel7=25:gx07=gx07*-1:ENDIF
IF sel7=26:gx06=gx06*-1:ENDIF
IF sel7=27:gx16=gx16*-1:ENDIF
IF sel7=28:gx09=gx09*-1:ENDIF
IF sel7=29:gx08=gx08*-1:ENDIF
IF sel7=30:gx25=gx25*-1:ENDIF
IF sel7=31:gx18=gx18*-1:ENDIF
IF sel7=32:gx24=gx24*-1:ENDIF
!!
 IF sel7=__:gx__=gx__*-1:ENDIF
!!
IF sel7=33:GOSUB gxreset: gx99=gx99*-1:ENDIF
IF sel7=34
 GOSUB dlgvgr
 vgr_gx=_vgr:vgr=vgr_gx
ENDIF
IF sel7=35:gx101=gx101*-1:ENDIF
IF sel7=36:t06gx=t06gx*-1:ENDIF
IF sel7=37:RETURN:ENDIF
GOSUB menu7
GOTO std7
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu7:
IF gx00=1:gx00$=smb$+"  Ebene an":ENDIF
IF gx00=-1: gx00$="     Ebene aus":ENDIF
IF gx01=1:gx01$=smb$+"  Andromeda ["+STR$(ROUND(gx_d01/10^6,1))+"Mpc]":ENDIF
IF gx01=-1: gx01$="     Andromeda ["+STR$(ROUND(gx_d01/10^3,1))+"kpc]":  ENDIF
IF gx05=1:gx05$=smb$+"  Triangulum ["+STR$(ROUND(gx_d02/10^6,1))+"Mpc]":ENDIF
IF gx05=-1: gx05$="     Triangulum ["+STR$(ROUND(gx_d02/10^3,1))+"kpc]":ENDIF
IF gx11=1:gx11$=smb$+"  M81 ["+STR$(ROUND(gx_d03/10^6,1))+"Mpc]":ENDIF
IF gx11=-1: gx11$="     M81 ["+STR$(ROUND(gx_d03/10^6,1))+"Mpc]":ENDIF
IF gx12=1:gx12$=smb$+"  M82 ["+STR$(ROUND(gx_d04/10^6,1))+"Mpc]":ENDIF
```

```
IF gx12=-1: gx12$="     M82 ["+STR$(ROUND(gx_d04/10^6,1))+"Mpc]":ENDIF
IF gx20=1:gx20$=smb$+"  M94 ["+STR$(ROUND(gx_d05/10^6,1))+"Mpc]":ENDIF
IF gx20=-1: gx20$="     M94 ["+STR$(ROUND(gx_d05/10^6,1))+"Mpc]":ENDIF
IF gx13=1:gx13$=smb$+"  M83 ["+STR$(ROUND(gx_d06/10^6,1))+"Mpc]":ENDIF
IF gx13=-1: gx13$="     M83 ["+STR$(ROUND(gx_d06/10^6,1))+"Mpc]":ENDIF
IF gx02=1:gx02$=smb$+"  M101 ["+STR$(ROUND(gx_d07/10^6,1))+"Mpc]":ENDIF
IF gx02=-1: gx02$="     M101 ["+STR$(ROUND(gx_d07/10^6,1))+"Mpc]":ENDIF
IF gx27=1:gx27$=smb$+"  M106 ["+STR$(ROUND(gx_d08/10^6,1))+"Mpc]":ENDIF
IF gx27=-1: gx27$="     M106 ["+STR$(ROUND(gx_d08/10^6,1))+"Mpc]":ENDIF
IF gx21=1:gx21$=smb$+"  M95 ["+STR$(ROUND(gx_d09/10^6,1))+"Mpc]":ENDIF
IF gx21=-1: gx21$="     M95 ["+STR$(ROUND(gx_d09/10^6,1))+"Mpc]":ENDIF
IF gx03=1:gx03$=smb$+"  M51 ["+STR$(ROUND(gx_d10/10^6,1))+"Mpc]":ENDIF
IF gx03=-1: gx03$="     M51 ["+STR$(ROUND(gx_d10/10^6,1))+"Mpc]":ENDIF
IF gx04=1:gx04$=smb$+"  M104 ["+STR$(ROUND(gx_d11/10^6,1))+"Mpc]":ENDIF
IF gx04=-1: gx04$="     M104 ["+STR$(ROUND(gx_d11/10^6,1))+"Mpc]":ENDIF
IF gx10=1:gx10$=smb$+"  M74 ["+STR$(ROUND(gx_d13/10^6,1))+"Mpc]":ENDIF
IF gx10=-1: gx10$="     M74 ["+STR$(ROUND(gx_d13/10^6,1))+"Mpc]":ENDIF
IF gx29=1:gx29$=smb$+"  M108 ["+STR$(ROUND(gx_d16/10^6,1))+"Mpc]":ENDIF
IF gx29=-1: gx29$="     M108 ["+STR$(ROUND(gx_d16/10^6,1))+"Mpc]":ENDIF
IF gx22=1:gx22$=smb$+"  M96 ["+STR$(ROUND(gx_d14/10^6,1))+"Mpc]":ENDIF
IF gx22=-1: gx22$="     M96 ["+STR$(ROUND(gx_d14/10^6,1))+"Mpc]":ENDIF
IF gx28=1:gx28$=smb$+"  M105 ["+STR$(ROUND(gx_d17/10^6,1))+"Mpc]":ENDIF
IF gx28=-1: gx28$="     M105 ["+STR$(ROUND(gx_d17/10^6,1))+"Mpc]":ENDIF
IF gx14=1:gx14$=smb$+"  M84 ["+STR$(ROUND(gx_d18/10^6,1))+"Mpc]":ENDIF
IF gx14=-1: gx14$="     M84 ["+STR$(ROUND(gx_d18/10^6,1))+"Mpc]":ENDIF
IF gx23=1:gx23$=smb$+"  M98 ["+STR$(ROUND(gx_d19/10^6,1))+"Mpc]":ENDIF
IF gx23=-1: gx23$="     M98 ["+STR$(ROUND(gx_d19/10^6,1))+"Mpc]":ENDIF
IF gx31=1:gx31$=smb$+"  M77 ["+STR$(ROUND(gx_d20/10^6,1))+"Mpc]":ENDIF
IF gx31=-1: gx31$="     M77 ["+STR$(ROUND(gx_d20/10^6,1))+"Mpc]":ENDIF
IF gx15=1:gx15$=smb$+"  M85 ["+STR$(ROUND(gx_d21/10^6,1))+"Mpc]":ENDIF
IF gx15=-1: gx15$="     M85 ["+STR$(ROUND(gx_d21/10^6,1))+"Mpc]":ENDIF
IF gx26=1:gx26$=smb$+"  M102 ["+STR$(ROUND(gx_d22/10^6,1))+"Mpc]":ENDIF
IF gx26=-1: gx26$="     M102 ["+STR$(ROUND(gx_d22/10^6,1))+"Mpc]":ENDIF
IF gx30=1:gx30$=smb$+"  M109 ["+STR$(ROUND(gx_d23/10^6,1))+"Mpc]":ENDIF
IF gx30=-1: gx30$="     M109 ["+STR$(ROUND(gx_d23/10^6,1))+"Mpc]":ENDIF
IF gx17=1:gx17$=smb$+"  M87 ["+STR$(ROUND(gx_d33/10^6,1))+"Mpc]":ENDIF
IF gx17=-1: gx17$="     M87 ["+STR$(ROUND(gx_d33/10^6,1))+"Mpc]":ENDIF
IF gx19=1:gx19$=smb$+"  M89 ["+STR$(ROUND(gx_d24/10^6,1))+"Mpc]":ENDIF
IF gx19=-1: gx19$="     M89 ["+STR$(ROUND(gx_d24/10^6,1))+"Mpc]":ENDIF
IF gx07=1:gx07$=smb$+"  M49 ["+STR$(ROUND(gx_d25/10^6,1))+"Mpc]":ENDIF
IF gx07=-1: gx07$="     M49 ["+STR$(ROUND(gx_d25/10^6,1))+"Mpc]":ENDIF
IF gx06=1:gx06$=smb$+"  M90 ["+STR$(ROUND(gx_d26/10^6,1))+"Mpc]":ENDIF
IF gx06=-1: gx06$="     M90 ["+STR$(ROUND(gx_d26/10^6,1))+"Mpc]":ENDIF
IF gx16=1:gx16$=smb$+"  M86 ["+STR$(ROUND(gx_d27/10^6,1))+"Mpc]":ENDIF
IF gx16=-1: gx16$="     M86 ["+STR$(ROUND(gx_d27/10^6,1))+"Mpc]":ENDIF
IF gx09=1:gx09$=smb$+"  M91 ["+STR$(ROUND(gx_d28/10^6,1))+"Mpc]":ENDIF
IF gx09=-1: gx09$="     M91 ["+STR$(ROUND(gx_d28/10^6,1))+"Mpc]":ENDIF
IF gx08=1:gx08$=smb$+"  M58 ["+STR$(ROUND(gx_d29/10^6,1))+"Mpc]":ENDIF
IF gx08=-1: gx08$="     M58 ["+STR$(ROUND(gx_d29/10^6,1))+"Mpc]":ENDIF
IF gx25=1:gx25$=smb$+"  M100 ["+STR$(ROUND(gx_d30/10^6,1))+"Mpc]":ENDIF
IF gx25=-1: gx25$="     M100 ["+STR$(ROUND(gx_d30/10^6,1))+"Mpc]":ENDIF
IF gx18=1:gx18$=smb$+"  M88 ["+STR$(ROUND(gx_d31/10^6,1))+"Mpc]":ENDIF
IF gx18=-1: gx18$="     M88 ["+STR$(ROUND(gx_d31/10^6,1))+"Mpc]":ENDIF
IF gx24=1:gx24$=smb$+"  M99 ["+STR$(ROUND(gx_d32/10^6,1))+"Mpc]":ENDIF
IF gx24=-1: gx24$="     M99 ["+STR$(ROUND(gx_d32/10^6,1))+"Mpc]":ENDIF
!!
 IF gx__=1:gx__$=smb$+"      [Mpc]":ENDIF
 IF gx__=-1: gx__$="         [Mpc]":ENDIF
!!
gx99$=smq$+"  Projektion an/aus"
gx100$=smq$+"  Vergrößerung: "+INT$(vgr_gx)+" x"
IF gx101=-1:gx101$=_smbl$+"    Symbol":ENDIF
IF gx101=1:gx101$=_mst$+"    Maßstab":ENDIF
IF t06gx=1:gx40$=smb$+"  Text":ENDIF
IF t06gx=-1:gx40$="     Text aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
gxreset:
IF gx99=1
 gx01=-1
 gx02=-1
 gx03=-1
 gx04=-1
 gx05=-1
 gx06=-1
 gx07=-1
 gx08=-1
```

```
 gx09=-1
 gx10=-1
 gx11=-1
 gx12=-1
 gx13=-1
 gx14=-1
 gx15=-1
 gx16=-1
 gx17=-1
 gx18=-1
 gx19=-1
 gx20=-1
 gx21=-1
 gx22=-1
 gx23=-1
 gx24=-1
 gx25=-1
 gx26=-1
 gx27=-1
 gx28=-1
 gx29=-1
 gx30=-1
 gx31=-1
 gx32=-1
 gx33=-1
ELSE
 gx01=1
 gx02=1
 gx03=1
 gx04=1
 gx05=1
 gx06=1
 gx07=1
 gx08=1
 gx09=1
 gx10=1
 gx11=1
 gx12=1
 gx13=1
 gx14=1
 gx15=1
 gx16=1
 gx17=1
 gx18=1
 gx19=1
 gx20=1
 gx21=1
 gx22=1
 gx23=1
 gx24=1
 gx25=1
 gx26=1
 gx27=1
 gx28=1
 gx29=1
 gx30=1
 gx31=1
 gx32=1
 gx33=1
ENDIF
RETURN
! % Dialog Galaxienhaufen %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog8prm:
gh00=1
gh01=-1
gh02=-1
gh03=-1
gh04=-1
gh05=-1
gh06=-1
gh07=-1
gh08=-1
gh09=-1
gh10=-1
gh11=-1
gh12=-1
gh13=-1
```

```
gh14=-1
gh15=-1
gh99=-1
t06gh=1
!!
 gh__=-1
!!
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog8:
GOSUB menu8
std8:
ARRAY.LOAD
sel8$[],gh00$,gh01$,gh03$,gh04$,gh06$,gh09$,gh02$,gh07$,gh10$,gh11$,gh05$,gh12$,gh13$
,gh14$,gh15$,gh08$,gh99$,gh30$,"Ok"
DIALOG.SELECT sel8, sel8$[],"Galaxien Haufen und Superhaufen: Darstellung/Projektion:"
IF sel8=1:gh00=gh00*-1:IF gh00=-1 THEN RETURN:ENDIF
IF sel8=2:gh01=gh01*-1:ENDIF
IF sel8=3:gh03=gh03*-1:ENDIF
IF sel8=4:gh04=gh04*-1:ENDIF
IF sel8=5:gh06=gh06*-1:ENDIF
IF sel8=6:gh09=gh09*-1:ENDIF
IF sel8=7:gh02=gh02*-1:ENDIF
IF sel8=8:gh07=gh07*-1:ENDIF
IF sel8=9:gh10=gh10*-1:ENDIF
IF sel8=10:gh11=gh11*-1:ENDIF
IF sel8=11:gh05=gh05*-1:ENDIF
IF sel8=12:gh12=gh12*-1:ENDIF
IF sel8=13:gh13=gh13*-1:ENDIF
IF sel8=14:gh14=gh14*-1:ENDIF
IF sel8=15:gh15=gh15*-1:ENDIF
IF sel8=16:gh08=gh08*-1:ENDIF
!!
 IF sel8=__:gh__=gh__*-1:ENDIF
!!
IF sel8=17:GOSUB ghreset: gh99=gh99*-1:ENDIF
!!
IF sel8=18
 GOSUB dlgvgr
 vgr_gh=_vgr:vgr=vgr_gh
ENDIF
!!
IF sel8=18:t06gh=t06gh*-1:ENDIF
IF sel8=19:RETURN:ENDIF
GOSUB menu8
GOTO std8
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu8:
IF gh00=1:gh00$=smb$+"  Ebene an":ENDIF
IF gh00=-1: gh00$="     Ebene aus":ENDIF
IF gh01=1:gh01$=smb$+"  Virgo  ["+STR$(ROUND(gh_d01/10^6,1))+"Mpc]":ENDIF
IF gh01=-1: gh01$="     Virgo  ["+STR$(ROUND(gh_d01/10^6,1))+"Mpc]":ENDIF
IF gh03=1:gh03$=smb$+"  Fornax  ["+STR$(ROUND(gh_d02/10^6,1))+"Mpc]":ENDIF
IF gh03=-1: gh03$="     Fornax  ["+STR$(ROUND(gh_d02/10^6,1))+"Mpc]":ENDIF
IF gh04=1:gh04$=smb$+"  Fornax II ["+STR$(ROUND(gh_d03/10^6,1))+"Mpc]":ENDIF
IF gh04=-1: gh04$="     Eridanus ["+STR$(ROUND(gh_d03/10^6,1))+"Mpc]":ENDIF
IF gh06=1:gh06$=smb$+"  Antila  ["+STR$(ROUND(gh_d04/10^6,1))+"Mpc]":ENDIF
IF gh06=-1: gh06$="     Antila  ["+STR$(ROUND(gh_d04/10^6,1))+"Mpc]":ENDIF
IF gh09=1:gh09$=smb$+"  Hydra  ["+STR$(ROUND(gh_d05/10^6,1))+"Mpc]":ENDIF
IF gh09=-1: gh09$="     Hydra  ["+STR$(ROUND(gh_d05/10^6,1))+"Mpc]":ENDIF
IF gh02=1:gh02$=smb$+"  Norma  ["+STR$(ROUND(gh_d06/10^6,1))+"Mpc]":ENDIF
IF gh02=-1: gh02$="     Norma  ["+STR$(ROUND(gh_d06/10^6,1))+"Mpc]":ENDIF
IF gh07=1:gh07$=smb$+"  Laniakea S.  ["+STR$(ROUND(gh_d07/10^6,1))+"Mpc]":ENDIF
IF gh07=-1: gh07$="     Großer Attraktor  ["+STR$(ROUND(gh_d07/10^6,1))+"Mpc]":ENDIF
IF gh10=1:gh10$=smb$+"  Perseus-Pi. S.  ["+STR$(ROUND(gh_d08/10^6,1))+"Mpc]":ENDIF
IF gh10=-1: gh10$="     Perseus-Pi. S.  ["+STR$(ROUND(gh_d08/10^6,1))+"Mpc]":ENDIF
IF gh11=1:gh11$=smb$+"  Coma S.  ["+STR$(ROUND(gh_d09/10^6,1))+"Mpc]":ENDIF
IF gh11=-1: gh11$="     Coma S.  ["+STR$(ROUND(gh_d09/10^6,1))+"Mpc]":ENDIF
IF gh05=1:gh05$=smb$+"  Coma  ["+STR$(ROUND(gh_d10/10^6,1))+"Mpc]":ENDIF
IF gh05=-1: gh05$="     Große Wand  ["+STR$(ROUND(gh_d10/10^6,1))+"Mpc]":ENDIF
IF gh12=1:gh12$=smb$+"  Ophiuchus S.  ["+STR$(ROUND(gh_d11/10^6,1))+"Mpc]":ENDIF
IF gh12=-1: gh12$="     Ophiuchus S.  ["+STR$(ROUND(gh_d11/10^6,1))+"Mpc]":ENDIF
IF gh13=1:gh13$=smb$+"  Leo S.  ["+STR$(ROUND(gh_d12/10^6,1))+"Mpc]":ENDIF
IF gh13=-1: gh13$="     Leo S.  ["+STR$(ROUND(gh_d12/10^6,1))+"Mpc]":ENDIF
IF gh14=1:gh14$=smb$+"  Herkules S.  ["+STR$(ROUND(gh_d13/10^6,1))+"Mpc]":ENDIF
IF gh14=-1: gh14$="     Herkules S.  ["+STR$(ROUND(gh_d13/10^6,1))+"Mpc]":ENDIF
```

```
IF gh15=1:gh15$=smb$+"  Shapley S. ["+STR$(ROUND(gh_d14/10^6,1))+"Mpc]":ENDIF
IF gh15=-1: gh15$="     Shapley S. ["+STR$(ROUND(gh_d14/10^6,1))+"Mpc]":ENDIF
IF gh08=1:gh08$=smb$+"  Geschoß ["+STR$(ROUND(gh_d15/10^9,1))+"Gpc]":ENDIF
IF gh08=-1: gh08$="     Geschoß ["+STR$(ROUND(gh_d15/10^6,1))+"Mpc]":ENDIF
!!
 IF gh__=1:gh__$=smb$+"  ___ [Mpc]":ENDIF
 IF gh__=-1: gh__$="     ___ [Mpc]":ENDIF
!!
gh99$=smq$+"  Projektion an/aus"
!gh100$=smq$+"  Vergrößerung: "+INT$(vgr_gh)+" ×"
IF t06gh=1:gh30$=smb$+"  Text":ENDIF
IF t06gh=-1:gh30$="     Text aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
ghreset:
IF gh99=1
 gh01=-1
 gh02=-1
 gh03=-1
 gh04=-1
 gh05=-1
 gh06=-1
 gh07=-1
 gh08=-1
 gh09=-1
 gh10=-1
 gh11=-1
 gh12=-1
 gh13=-1
 gh14=-1
 gh15=-1
ELSE
 gh01=1
 gh02=1
 gh03=1
 gh04=1
 gh05=1
 gh06=1
 gh07=1
 gh08=1
 gh09=1
 gh10=1
 gh11=1
 gh12=1
 gh13=1
 gh14=1
 gh15=1
ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Dialog Quasare %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog9prm:
gq00=1
gq01=-1
gq02=-1
gq03=-1
gq04=-1
gq05=-1
gq06=-1
gq07=-1
gq08=-1
gq09=-1
gq10=-1
gq11=-1
gq12=-1
gq13=-1
gq14=-1
gq15=-1
gq16=-1
gq17=-1
gq18=-1
gq19=-1
gq20=-1
gq99=-1
gq101=1 %%%
t06gq=1
!!
```

```
 gq__=-1
!!
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog9:
GOSUB menu9
std9:
ARRAY.LOAD
sel9$[],gq00$,gq01$,gq13$,gq03$,gq14$,gq04$,gq20$,gq15$,gq05$,gq06$,gq16$,gq07$,gq09$
,gq08$,gq17$,gq18$,gq19$,gq02$,gq99$,gq100$,gq101$,gq30$,"Ok"
DIALOG.SELECT sel9, sel9$[],"Quasare: Darstellung/Projektion:"
IF sel9=1:gq00=gq00*-1:IF gq00=-1 THEN RETURN:ENDIF
IF sel9=2:gq01=gq01*-1:ENDIF
IF sel9=3:gq13=gq13*-1:ENDIF
IF sel9=4:gq03=gq03*-1:ENDIF
IF sel9=5:gq14=gq14*-1:ENDIF
IF sel9=6:gq04=gq04*-1:ENDIF
IF sel9=7:gq20=gq20*-1:ENDIF
IF sel9=8:gq15=gq15*-1:ENDIF
IF sel9=9:gq05=gq05*-1:ENDIF
IF sel9=10:gq06=gq06*-1:ENDIF
IF sel9=11:gq16=gq16*-1:ENDIF
IF sel9=12:gq07=gq07*-1:ENDIF
IF sel9=13:gq09=gq09*-1:ENDIF
IF sel9=14:gq08=gq08*-1:ENDIF
IF sel9=15:gq17=gq17*-1:ENDIF
IF sel9=16:gq18=gq18*-1:ENDIF
IF sel9=17:gq19=gq19*-1:ENDIF
IF sel9=18:gq02=gq02*-1:ENDIF
!!
 IF sel9=_:gq__=gq__*-1:ENDIF
!!
IF sel9=19:GOSUB gqreset: gq99=gq99*-1:ENDIF
IF sel9=20
 GOSUB dlgvgr
 vgr_gq=_vgr:vgr=vgr_gq
ENDIF
IF sel9=21:gq101=gq101*-1:ENDIF
IF sel9=22:t06gq=t06gq*-1:ENDIF
IF sel9=23:RETURN:ENDIF
GOSUB menu9
GOTO std9
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu9:
IF gq00=1:gq00$=smb$+"  Ebene an":ENDIF
IF gq00=-1: gq00$="     Ebene aus":ENDIF
IF gq01=1:gq01$=smb$+"  UGC 8085 ["+STR$(ROUND(gq_d01/10^6,1))+"Mpc]":ENDIF
IF gq01=-1: gq01$="     UGC 8085 ["+STR$(ROUND(gq_d01/10^6,1))+"Mpc]":ENDIF
IF gq13=1:gq13$=smb$+"  J1430+1339 ["+STR$(ROUND(gq_d02/10^6,1))+"Mpc]":ENDIF
IF gq13=-1: gq13$="     J1430+1339 ["+STR$(ROUND(gq_d02/10^6,1))+"Mpc]":ENDIF
IF gq03=1:gq03$=smb$+"  3C 273 ["+STR$(ROUND(gq_d03/10^6,1))+"Mpc]":ENDIF
IF gq03=-1: gq03$="     3C 273 ["+STR$(ROUND(gq_d03/10^6,1))+"Mpc]":ENDIF
IF gq14=1:gq14$=smb$+"  CID-42 ["+STR$(ROUND(gq_d04/10^9,1))+"Gpc]":ENDIF
IF gq14=-1: gq14$="     CID-42 ["+STR$(ROUND(gq_d04/10^9,1))+"Gpc]":ENDIF
IF gq04=1:gq04$=smb$+"  3C 48 ["+STR$(ROUND(gq_d05/10^9,1))+"Gpc]":ENDIF
IF gq04=-1: gq04$="     3C 48 ["+STR$(ROUND(gq_d05/10^9,1))+"Gpc]":ENDIF
IF gq20=1:gq20$=smb$+"  3C 47 ["+STR$(ROUND(gq_d06/10^9,1))+"Gpc]":ENDIF
IF gq20=-1: gq20$="     3C 47 ["+STR$(ROUND(gq_d06/10^9,1))+"Gpc]":ENDIF
IF gq15=1:gq15$=smb$+"  3C 279 ["+STR$(ROUND(gq_d07/10^9,1))+"Gpc]":ENDIF
IF gq15=-1: gq15$="     3C 279 ["+STR$(ROUND(gq_d07/10^9,1))+"Gpc]":ENDIF
IF gq05=1:gq05$=smb$+"  3C 147 ["+STR$(ROUND(gq_d08/10^9,1))+"Gpc]":ENDIF
IF gq05=-1: gq05$="     3C 147 ["+STR$(ROUND(gq_d08/10^9,1))+"Gpc]":ENDIF
IF gq06=1:gq06$=smb$+"  CTA-102 ["+STR$(ROUND(gq_d09/10^9,1))+"Gpc]":ENDIF
IF gq06=-1: gq06$="     CTA-102 ["+STR$(ROUND(gq_d09/10^9,1))+"Gpc]":ENDIF
IF gq16=1:gq16$=smb$+"  Einstein Cross ["+STR$(ROUND(gq_d10/10^9,1))+"Gpc]":ENDIF
IF gq16=-1: gq16$="     Einstein Cross ["+STR$(ROUND(gq_d10/10^9,1))+"Gpc]":ENDIF
IF gq07=1:gq07$=smb$+"  QSO 0957+561 ["+STR$(ROUND(gq_d11/10^9,1))+"Gpc]":ENDIF
IF gq07=-1: gq07$="     QSO 0957+561 ["+STR$(ROUND(gq_d11/10^9,1))+"Gpc]":ENDIF
IF gq09=1:gq09$=smb$+"  Huge-LQG ["+STR$(ROUND(gq_d12/10^9,1))+"Gpc]":ENDIF
IF gq09=-1: gq09$="     Huge-LQG ["+STR$(ROUND(gq_d12/10^9,1))+"Gpc]":ENDIF
IF gq08=1:gq08$=smb$+"  3C 9 ["+STR$(ROUND(gq_d13/10^9,1))+"Gpc]":ENDIF
IF gq08=-1: gq08$="     3C 9 ["+STR$(ROUND(gq_d13/10^9,1))+"Gpc]":ENDIF
IF gq17=1:gq17$=smb$+"  TON 618 ["+STR$(ROUND(gq_d14/10^9,1))+"Gpc]":ENDIF
IF gq17=-1: gq17$="     TON 618 ["+STR$(ROUND(gq_d14/10^9,1))+"Gpc]":ENDIF
IF gq18=1:gq18$=smb$+"  H1413+117 ["+STR$(ROUND(gq_d15/10^9,1))+"Gpc]":ENDIF
IF gq18=-1: gq18$="     H1413+117 ["+STR$(ROUND(gq_d15/10^9,1))+"Gpc]":ENDIF
```

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IF gq19=1:gq19$=smb$+"  APM 08279+5255 ["+STR$(ROUND(gq_d16/10^9,1))+"Gpc]":ENDIF
IF gq19=-1: gq19$="     APM 08279+5255 ["+STR$(ROUND(gq_d16/10^9,1))+"Gpc]":ENDIF
IF gq02=1:gq02$=smb$+"  QSO J0313-1806 ["+STR$(ROUND(gq_d17/10^9,1))+"Gpc]":ENDIF
IF gq02=-1: gq02$="     QSO J0313-1806 ["+STR$(ROUND(gq_d17/10^9,1))+"Gpc]":ENDIF
!!
 IF gq__=1:gq__$=smb$+"  __ [__pc]":ENDIF
 IF gq__=-1: gq__$="     __ [__pc]":ENDIF
!!
gq99$=smq$+"  Projektion an/aus"
gq100$=smq$+"  Vergrößerung: "+INT$(vgr_gq)+" ×"
IF gq101=-1:gq101$=_smbl$+"    Symbol":ENDIF
IF gq101=1:gq101$=_mst$+"    Maßstab":ENDIF
IF t06gq=1:gq30$=smb$+"  Text":ENDIF
IF t06gq=-1:gq30$="     Text aus":ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
gqreset:
IF gq99=1
 gq01=-1
 gq02=-1
 gq03=-1
 gq04=-1
 gq05=-1
 gq06=-1
 gq07=-1
 gq08=-1
 gq09=-1
 gq10=-1
 gq11=-1
 gq12=-1
 gq13=-1
 gq14=-1
 gq15=-1
 gq16=-1
 gq17=-1
 gq18=-1
 gq19=-1
 gq20=-1
ELSE
 gq01=1
 gq02=1
 gq03=1
 gq04=1
 gq05=1
 gq06=1
 gq07=1
 gq08=1
 gq09=1
 gq10=1
 gq11=1
 gq12=1
 gq13=1
 gq14=1
 gq15=1
 gq16=1
 gq17=1
 gq18=1
 gq19=1
 gq20=1
ENDIF
RETURN
! %, Eingabedatei für weitere Objekte %%%%%%%%%%%%%%%%%%%%
objdatei:
DIM inp$[100]
FILE.DIR pth$, inp$[]
SELECT ninp, inp$[], _name$+" Objekt Definitionsdatei... ", "Select File"
gwf$=inp$[ninp]
ARRAY.DELETE inp$[]
RETURN
! % Weitere Objekte ini %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
weitere ini:                          % Objekte einlesen
DIM gw$[1000]
DIM gw_p[1000]
DIM gw_r[1000]
DIM gw_d[1000]
DIM gwdg[1000]
DIM gwdm[1000]
```

```
DIM gwds[1000]
DIM gwh_[1000]
DIM gwm_[1000]
DIM gws_[1000]
DIM gw_t[1000]
DIM gw_cl[1000]
FOR i_gw=1 TO 1000
 gw_p[i_gw]=-1                    %Projektionsvariable ini
NEXT                              %Objektdatei
GOSUB weitere_in
! % Weitere Objekte %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
RETURN
weitere_in:
n_gw=0
FILE.EXISTS fw, gwf$
IF fw
 TEXT.OPEN r, fw, gwf$
 DO
  TEXT.READLN fw, gwf_$:n_gw=n_gw+1          %Anzahl n_gw
 UNTIL gwf_$="EOF"
 TEXT.CLOSE fw
 n_gw=(n_gw-1)/12 %Anzahl der Optionen
 TEXT.OPEN r, fw, gwf$                      %Einlesen
 FOR i_gw=1 TO n_gw
  TEXT.READLN fw, gwf_$                     % Nr
  TEXT.READLN fw, gwf_$:gw$[i_gw]=gwf_$     % Name
  TEXT.READLN fw, gwf_$:gw_r[i_gw]=VAL(gwf_$) % r Lj
  IF gw_r[i_gw]=-1 THEN gw_r[i_gw]=gr_0     % Obj. Gr.
  TEXT.READLN fw, gwf_$:gw_d[i_gw]=VAL(gwf_$) % d Lj
  TEXT.READLN fw, gwf_$:gwdg[i_gw]=VAL(gwf_$) % dek g
  TEXT.READLN fw, gwf_$:gwdm[i_gw]=VAL(gwf_$) % dek m
  TEXT.READLN fw, gwf_$:gwds[i_gw]=VAL(gwf_$) % dek s
  TEXT.READLN fw, gwf_$:gwh_[i_gw]=VAL(gwf_$) % ra h
  TEXT.READLN fw, gwf_$:gwm_[i_gw]=VAL(gwf_$) % ra m
  TEXT.READLN fw, gwf_$:gws_[i_gw]=VAL(gwf_$) % ra s
  TEXT.READLN fw, gwf_$:gw_t[i_gw]=VAL(gwf_$) % typ
  TEXT.READLN fw, gwf_$:gw_cl[i_gw]=VAL(gwf_$) % typfarbe
 NEXT
 TEXT.CLOSE fw
ELSE
 INCLUDE ssr_weitere_ini.bas      %wenn keine Objektdatei
ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
weitere_out:                      % Objekte ausgeben
DIALOG.MESSAGE                    "Weitere                    Objekte:","Astronomische
Objekte...",selob,"Anlegen","Löschen","Abbrechen"
IF selob=1
 n_gw=n_gw+1
 INPUT"Objektname…",gw_name$,"Objekt"+INT$(n_gw)
 INPUT"Radius in Lj[-1:Stern]…",gw_r_,-1
 gw_ty_=gw_r_:IF gw_r_>-1 THEN gw_ty_=0
 INPUT"Distanz in Lj…",gw_d_,15000
 INPUT"Rek. Stunde…",gw_rh_,0
 INPUT"Rek. Minute…",gw_rm_,0
 INPUT"Rek. Sekunde …",gw_rs_,0
 INPUT"Dekl. Grad…",gw_dg_,0
 INPUT"Dekl. Minute…",gw_dm_,0
 INPUT"Dekl. Sekunde …",gw_ds_,0
 % Typus und Farbe %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 ARRAY.LOAD  seltp_$[],"Stern  Gr1","Stern  Gr2","Stern  Gr3","Roter  Riese","Blauer
Riese","Nova/Supernova","Sternhaufen","Nebel","Planetarer
Nebel","Kugelsternhaufen","Milchstraßenwolke","Galaxie","Haufen","Superhaufen","Quasa
r"
 DIALOG.SELECT seltp, seltp_$[],"Weitere Objekte: Typ..."
 DIALOG.MESSAGE       "Weitere       Objekte:","Neues       astronomisches       Objekt
anlegen?",wrtout,"Speichern","Abbrechen"
 IF wrtout=1
  obnrdat$="&"+FORMAT$("0%%%%",n_gw)+"["+d$+"/"+m$+"/"+y$+"]"
  TEXT.OPEN a, fw, gwf$                 %Ausgabe
  TEXT.WRITELN fw, obnrdat$             % Nummer, Datum
  TEXT.WRITELN fw, gw_name$             % Name
  TEXT.WRITELN fw, gw_r_                % r Lj
  TEXT.WRITELN fw, gw_d_                % d Lj
  TEXT.WRITELN fw, gw_dg_               % Dekl Grad
  TEXT.WRITELN fw, gw_dm_               % Dekl Minute
  TEXT.WRITELN fw, gw_ds_               % Dekl Sekunde
```

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  TEXT.WRITELN fw, gw_rh_              % Rekt Stunde
  TEXT.WRITELN fw, gw_rm_              % Rekt Minute
  TEXT.WRITELN fw, gw_rs_              % Rekt Sekunde
  TEXT.WRITELN fw, gw_ty_              % Typ
  TEXT.WRITELN fw, seltp               % Typfarbe
  TEXT.CLOSE fw
 ENDIF
ENDIF
IF selob=2                             % Alle Löschen
 DIALOG.MESSAGE    "Weitere    Objekte:","Alle    weiteren    astronomischen    Objekte
löschen?",selob0,"Löschen","Abbrechen"
 IF selob0=1
  TEXT.OPEN w, fw, gwf$
  TEXT.CLOSE fw
 ENDIF
ENDIF
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! % Dialog Weitere Objekte %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog11prm:
gw00=1
gw99=-1
gw101=1
t06gw=1
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog11:
GOSUB weitere_in
GOSUB menu11
std11:
DIM sel11$[n_gw+8]
!
sel11$[1]=gw00$
sel11$[2]=smq$+"  Datei: "+gwf$
FOR i_gw=1 TO n_gw
 sel11$[i_gw+2]=gwmn$[i_gw]
NEXT
sel11$[n_gw+3]=smq$+"  Objekt anlegen/löschen"
sel11$[n_gw+4]=gw99$
sel11$[n_gw+5]=gw100$
sel11$[n_gw+6]=gw101$
sel11$[n_gw+7]=gw30$
sel11$[n_gw+8]="Ok"
!
DIALOG.SELECT sel11, sel11$[],"Weitere Objekte: Darstellung/Projektion:"
IF sel11=1:gw00=gw00*-1:IF gw00=-1 THEN RETURN:ENDIF
IF sel11=2:GOSUB objdatei:GOSUB weitere_in:ENDIF
FOR i_gw=1 TO n_gw                   % Weitere Objekte
 IF sel11=i_gw+2:gw_p[i_gw]=gw_p[i_gw]*-1:ENDIF
NEXT
IF sel11=n_gw+3:GOSUB weitere_out:GOSUB weitere_in:ENDIF
IF sel11=n_gw+4:GOSUB gwreset: gw99=gw99*-1:ENDIF
IF sel11=n_gw+5
 GOSUB dlgvgr:vgr_w1=_vgr:vgr=vgr_w1
ENDIF
IF sel11=n_gw+6:gw101=gw101*-1:ENDIF
IF sel11=n_gw+7:t06gw=t06gw*-1:ENDIF
IF sel11=n_gw+8:RETURN:ENDIF
!
GOSUB menu11
GOTO std11
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menu11:
IF n_gw>0 THEN DIM gwmn$[n_gw]
IF gw00=1:gw00$=smb$+"  Ebene an":ENDIF
IF gw00=-1: gw00$="     Ebene aus":ENDIF
FOR i_gw=1 TO n_gw                   % Weitere Objekte
 IF gw_p[i_gw]=1:  gwmn$[i_gw]=smb$+"  "+gw$[i_gw]:ENDIF
 IF gw_p[i_gw]=-1: gwmn$[i_gw]="     "+gw$[i_gw]:ENDIF
NEXT
gw99$=smq$+"  Projektion an/aus"
gw100$=smq$+"  Vergrößerung: "+INT$(vgr_w1)+" ×"
IF gw101=-1:gw101$=_smbl$+"    Symbol":ENDIF
IF gw101=1:gw101$=_mst$+"    Maßstab":ENDIF
IF t06gw=1:gw30$=smb$+"  Text":ENDIF
IF t06gw=-1:gw30$="     Text aus":ENDIF
```

```
RETURN
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
gwreset:
IF gw99=1
 FOR i_gw=1 TO n_gw
  gw_p[i_gw]=-1
 NEXT
ENDIF
IF gw99=-1
 FOR i_gw=1 TO n_gw
  gw_p[i_gw]=1
 NEXT
ENDIF
RETURN
! % Dialog Größenvergleich %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
menuvgl:
vg01$="Beteigeuze ["+STR$(ROUND( r_btg_ae,2))+"AE]"
vg02$="Orionnebel ["+STR$(ROUND( r_orn_ae/Lj_,2))+"Lj]"
vg03$="Aldebaran ["+STR$(ROUND( r_adb_ae,2))+"AE]"
vg04$= _ga$+" Centauri A ["+STR$(ROUND( r_acn_ae,3))+"AE]"
vg05$= "Sirius ["+STR$(ROUND( r_srs_ae,3))+"AE]"
vg06$= "RSGC2-01 ["+STR$(ROUND( r_rsg_ae,2))+"AE]"
ARRAY.LOAD vgl$[],vg04$,vg05$,vg03$,vg01$,vg06$,vg02$
DIALOG.SELECT vglst, vgl$[],"Größenvergleich:"
objv$=vgl$[vglst]
RETURN
! % Dialog Skalen %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog10prm:
s01=-1
s02=-1
s03=-1
s04=-1
s08=-1
s10=1
t31=-1
t34=-1
t37=-1
t39=-1
t99=-1
t98=-1
RETURN
dialog10:
GOSUB menu10
std10:
ARRAY.LOAD
sel10$[],o11$,sk01$,sk02$,sk03$,sk04$,sk06$,o01$,o02$,o03$,o04$,o08$,o09$,sk05$,o10$,
"Ok"
DIALOG.SELECT sel10, sel10$[],"Skalen:"
IF sel10=1:GOSUB calc:ENDIF
IF sel10=2:s10=s10*-1:ENDIF
IF sel10=3:t31=t31*-1
 IF t31=1
  INPUT"Stunde h=…",h_,0
  INPUT"Minute min=…",m_,0
  INPUT"Sekunde sec=…",s_,0
  rk$=" "+INT$(h_)+_rh$
  rk$= rk$+INT$(m_)+"'"
  rk$= rk$+INT$(s_)+_rsc$
 ENDIF
 IF t31=-1 THEN t39=-1
ENDIF
IF sel10=4:t39=t39*-1
 IF t31=-1 THEN t39=-1
 IF t39=1
  INPUT"Grad °=…",dg_,0
  INPUT"Minute min=…",dm_,0
  INPUT"Sekunde sec=…",ds_,0
  dkl$=" "+INT$(dg_)+"°"
  dkl$= dkl$+INT$(dm_)+"'"
  dkl$= dkl$+INT$(ds_)+_rsc$
 ENDIF
ENDIF
IF sel10=5:t34=t34*-1:ENDIF
IF sel10=6:t99=t99*-1:ENDIF
IF sel10=7:s01=s01*-1:ENDIF
IF sel10=8:s02=s02*-1:ENDIF
IF sel10=9
```

```
 s03=s03*-1
 swu=-1:ur$=""
 IF s07=1 & s03=1
  GOSUB dialogu
 ENDIF
ENDIF
IF sel10=10:s04=s04*-1:ENDIF
IF sel10=11:s08=s08*-1
 IF s08=1 THEN GOSUB dialogk
ENDIF
IF sel10=13
 swvgl=swvgl*-1
 IF swvgl=1 THEN GOSUB menuvgl
ENDIF
IF sel10=12:t98=t98*-1:ENDIF
IF sel10=14:GOSUB lbrte:ENDIF
IF sel10=15:RETURN:ENDIF
GOSUB menu10
GOTO std10
RETURN
menu10:
o11$=_clc$+"  Berechnungen..." %+cpb$
IF s10=1:sk01$=smb$+"  Entfernung und Zeit":ENDIF
IF s10=-1: sk01$="     Entfernung und Zeit aus":ENDIF
IF t31=1:sk02$=smb$+"  Rektaszension "+_ga$+rk$:ENDIF
IF t31=-1: sk02$="     Rektaszension "+_ga$:ENDIF
IF t39=1:sk03$=smb$+"  Deklination "+_gd$+dkl$:ENDIF
IF t39=-1: sk03$="     Deklination "+_gd$:ENDIF
IF t99=1:sk06$=smb$+"  Tierkreis "+_tkz$:ENDIF
IF t99=-1: sk06$="     Tierkreis aus":ENDIF
IF t34=1:sk04$=smb$+"  Himmelsgewölbe "+_hgw$:ENDIF
IF t34=-1: sk04$="     Himmelsgewölbe aus":ENDIF
IF s01=1:o01$=smb$+"  Jahreszeiten "+_jzt$:ENDIF
IF s01=-1: o01$="     Jahreszeiten aus":ENDIF
IF s02=1:o02$=smb$+"  Monate "+_mnte$:ENDIF
IF s02=-1: o02$="     Monate aus":ENDIF
IF s03=1:o03$=smb$+"  Horizont "+ur$:ENDIF
IF s03=-1: o03$="     Horizont aus":ENDIF
IF s04=1:o04$=smb$+"  Erdprojektion "+_epr$:ENDIF
IF s04=-1: o04$="     Erdprojektion aus":ENDIF
IF s08=1:o08$=smb$+"  Kompass "+kp$:ENDIF
IF s08=-1:o08$="     Kompass aus":ENDIF
IF swvgl=1:sk05$=smb$+"  = "+objv$:ENDIF
IF swvgl=-1: sk05$="     Größenvergleich aus":ENDIF
IF t98=1:o09$=smb$+"  Historie "+_hist$:ENDIF
IF t98=-1:o09$="     Historie aus":ENDIF
o10$=smq$+"  Linienbreite: "+INT$(skl)
RETURN
! Berechnungen %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
calc::calcst::CLIPBOARD.GET cpb$
calcn=11:DIM sel$[calcn]:DIM sel0$[calcn-2]
sel0$[1]="Faktor x zu Lichtgeschwindigkeit c[m/s]"
sel0$[2]="Faktor x zu Astronomischer Einheit AE[km]"
sel0$[3]="Parallaxe pi[mas] zu Parsec pc"
sel0$[4]="Modulus mu[mag] zu Parsec pc"
sel0$[5]="Parsec pc zu Lichtjahr Lj"
sel0$[6]="Hexagesimal [°/h:min:sec] zu Dezimal [°]"
sel0$[7]="Winkelgrad [°] zu Bogenmaß [rad]"
sel0$[8]="Winkelausdehnung V[°] bei Dist. d zu Radius r"
sel0$[9]="Zehnerpotenz zu Einheit"
!
sel$[1]=sel0$[1]+eq1$
sel$[2]=sel0$[2]+eq2$
sel$[3]=sel0$[3]+eq3$
sel$[4]=sel0$[4]+eq4$
sel$[5]=sel0$[5]+eq5$
sel$[6]=sel0$[6]+eq6$
sel$[7]=sel0$[7]+eq7$
sel$[8]=sel0$[8]+eq8$
sel$[9]=sel0$[9]+eq9$
sel$[10]="=[ "+cpb$+u_eh$+" ]":u_eh$=""
!
sel$[11]="Ok"
DIALOG.SELECT sel, sel$[],_clc$+" Berechnungen:
IF sel=1 % Faktor c
 INPUT "Faktor x...",u_fx,1
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
 u_xc=u_fx*c_m
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_xc$=STR$(ROUND(u_xc,9))
 u_xc0$=STR$(ROUND(u_xc,4))
 CLIPBOARD.PUT u_xc$
 u_dlgm$=""
 u_dlgm$=u_dlgm$+STR$(ROUND(u_fx,2))+"x = "
 u_dlgm$=u_dlgm$+u_xc0$+"m/s"
 DIALOG.MESSAGE sel0$[1]+", wobei xc = x*c[m/s]:",u_dlgm$,u_msg
 eq1$="=":eq2$="":eq3$="":eq4$="":eq5$="":eq6$="":eq7$="":eq8$="":eq9$=""
ENDIF
IF sel=2 % Faktor AE
 INPUT "Faktor x...",u_fx,1
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_xa=u_fx*au_/1000
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_xa$=STR$(ROUND(u_xa,9))
 u_xa0$=STR$(ROUND(u_xa,4))
 CLIPBOARD.PUT u_xa$
 u_dlgm$=""
 u_dlgm$=u_dlgm$+STR$(ROUND(u_fx,2))+"x = "
 u_dlgm$=u_dlgm$+u_xa0$+"km"
 DIALOG.MESSAGE sel0$[2]+", wobei xAE = x*AE[km]:",u_dlgm$,u_msg
 eq1$="":eq2$="=":eq3$="":eq4$="":eq5$="":eq6$="":eq7$="":eq8$="":eq9$=""
ENDIF
IF sel=3 % Parallaxe zu pc
 !CLIPBOARD.GET cpb$
 INPUT "Parallaxe mas...",u_px,VAL(cpb$)
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_pc=1/(u_px/1000)
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_pc$=STR$(ROUND(u_pc,9))
 u_pc0$=STR$(ROUND(u_pc,4))
 CLIPBOARD.PUT u_pc$
 u_dlgm$=""
 u_dlgm$=u_dlgm$+STR$(ROUND(u_px,3))+"mas = "
 u_dlgm$=u_dlgm$+u_pc0$+"pc"
 DIALOG.MESSAGE sel0$[3]+", wobei pc = 1/(mas/1000):",u_dlgm$,u_msg
 eq1$="":eq2$="":eq3$="=":eq4$="":eq5$="":eq6$="":eq7$="":eq8$="":eq9$=""
ENDIF
IF sel=4 % Modulus mu=m-M zu pc
 !CLIPBOARD.GET cpb$
 INPUT "Modulus mag...",u_mu,10
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_pc=10^((u_mu/5)+1)
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_pc$=STR$(ROUND(u_pc,9))
 u_pc0$=STR$(ROUND(u_pc,4))
 CLIPBOARD.PUT u_pc$
 u_dlgm$=""
 u_dlgm$=u_dlgm$+STR$(ROUND(u_mu,3))+"mag = "
 u_dlgm$=u_dlgm$+u_pc0$+"pc"
 DIALOG.MESSAGE sel0$[4]+", wobei pc = 10^((mag/5)+1):",u_dlgm$,u_msg
 eq1$="":eq2$="":eq3$="":eq4$="=":eq5$="":eq6$="":eq7$="":eq8$="":eq9$=""
ENDIF
IF sel=5 % Pc zu Lj
 CLIPBOARD.GET cpb$
 INPUT "Parsec pc...",u_pc,VAL(cpb$)
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_lj=u_pc*pcm_/Lj_m
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_lj$=STR$(ROUND(u_lj,9))
 u_lj0$=STR$(ROUND(u_lj,4))
 CLIPBOARD.PUT u_lj$
 u_dlgm$=""
 u_dlgm$=u_dlgm$+STR$(ROUND(u_pc,4))+"pc = "
 u_dlgm$=u_dlgm$+u_lj0$+"Lj"
 DIALOG.MESSAGE sel0$[5]+", wobei Lj = pc*3.26156:",u_dlgm$,u_msg
 eq1$="":eq2$="":eq3$="":eq4$="":eq5$="=":eq6$="":eq7$="":eq8$="":eq9$=""
ENDIF
IF sel=6 % hex in dez
 !CLIPBOARD.GET cpb$
 INPUT "°/h...",u_gh,0
 INPUT "min '...",u_min,0
 INPUT "sec ''...",u_sec,0
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_dez=u_gh+u_min/60+u_sec/(60^2)
```

```
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_dez$=STR$(ROUND(u_dez,9))
 u_dez0$=STR$(ROUND(u_dez,4))
 CLIPBOARD.PUT u_dez$
 u_dlgm$=""
 u_dlgm$=u_dlgm$+STR$(ROUND(u_gh,2))+"°/h "
 u_dlgm$=u_dlgm$+STR$(ROUND(u_min,2))+"' "
 u_dlgm$=u_dlgm$+STR$(ROUND(u_sec,4))+"'' = "
 u_dlgm$=u_dlgm$+u_dez0$+"°/h"
 DIALOG.MESSAGE sel0$[6]+", wobei dx° = hx°+(hx'/60)+(hx''/3600):",u_dlgm$,u_msg
 eq1$="":eq2$="":eq3$="":eq4$="":eq5$="":eq6$="=":eq7$="":eq8$="":eq9$=""
ENDIF
IF sel=7 % grad in rad
 INPUT "Winkelgrad a°...",u_wkg,45
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_rad=u_wkg/180*PI()
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_rad$=STR$(ROUND(u_rad,14))
 u_rad0$=STR$(ROUND(u_rad,5))
 CLIPBOARD.PUT u_rad$
 u_dlgm$=""
 u_dlgm$=u_dlgm$+STR$(ROUND(u_wkg,2))+"° = "
 u_dlgm$=u_dlgm$+u_rad$+"rad"
 DIALOG.MESSAGE sel0$[7]+", wobei rad = (a°/180) pi: ",u_dlgm$,u_msg
 eq1$="":eq2$="":eq3$="":eq4$="":eq5$="":eq6$="":eq7$="=":eq8$="":eq9$=""
ENDIF
IF sel=8 % V in r
 !CLIPBOARD.GET cpb$
 INPUT "V°...",u_V,VAL(cpb$)
 INPUT "d...",u_d,100
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 u_Vr=u_v/180*PI() % zu rad
 u_r=u_d*TAN(u_Vr/2)
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 CLIPBOARD.PUT STR$(u_r)
 u_dlgm$="V="
 u_dlgm$=u_dlgm$+STR$(ROUND(u_v,4))+"° bei d="
 u_dlgm$=u_dlgm$+STR$(ROUND(u_d,2))+" : r="
 u_dlgm$=u_dlgm$+STR$(ROUND(u_r,4))
 DIALOG.MESSAGE sel0$[8]+", wobei r = d tan(V[rad]/2): ",u_dlgm$,u_msg
 eq1$="":eq2$="":eq3$="":eq4$="":eq5$="":eq6$="":eq7$="":eq8$="=":eq9$=""
ENDIF
IF sel=9 % 10^n in Einheit
 !CLIPBOARD.GET cpb$
 INPUT "x ...",u_xzp,VAL(cpb$)
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 IF u_xzp>=10^3 THEN u_eh=u_xzp/10^3:u_eh$="k"
 IF u_xzp>=10^6 THEN u_eh=u_xzp/10^6:u_eh$="M"
 IF u_xzp>=10^9 THEN u_eh=u_xzp/10^9:u_eh$="G"
 IF u_xzp>=10^12 THEN u_eh=u_xzp/10^12:u_eh$="T"
 IF u_xzp>=10^15 THEN u_eh=u_xzp/10^15:u_eh$="P"
 IF u_xzp>=10^18 THEN u_eh=u_xzp/10^18:u_eh$="E"
 IF u_xzp>=10^21 THEN u_eh=u_xzp/10^21:u_eh$="Z"
 IF u_xzp>=10^24 THEN u_eh=u_xzp/10^24:u_eh$="Y"
 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 CLIPBOARD.PUT STR$(ROUND(u_eh,3))
 u_dlgm$=""
 u_dlgm$=u_dlgm$+STR$(ROUND(u_xzp,4))+" = "
 u_dlgm$=u_dlgm$+STR$(ROUND(u_eh,1))+u_eh$
 DIALOG.MESSAGE sel0$[9]+": ",u_dlgm$,u_msg
 eq1$="":eq2$="":eq3$="":eq4$="":eq5$="":eq6$="":eq7$="":eq8$="":eq9$="="
ENDIF
IF sel=11:CLIPBOARD.GET cpb$:RETURN:ENDIF
!CLIPBOARD.GET cpb$
GOTO calcst
RETURN
! % Dialog Linienbreite %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
lbrte:
ARRAY.LOAD selbr$[],"1 [sehr schmal]","2 [schmal]","3 [normal]","4 [breit]","5 [sehr
breit]"
DIALOG.SELECT skl, selbr$[],"Linienbreite:"
RETURN
! % Dialog Vergrösserung %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dlgvgr:
ARRAY.LOAD vgrf$[],"1 × [Maßstab]","2 ×","3 ×","4 ×","5 ×","10 ×","20 ×"
DIALOG.SELECT vgrf, vgrf$[],"Vergrößerungsfaktor:"
IF vgrf=1 THEN _vgr=1
```

```
IF vgrf=2 THEN _vgr=2
IF vgrf=3 THEN _vgr=3
IF vgrf=4 THEN _vgr=4
IF vgrf=5 THEN _vgr=5
IF vgrf=6 THEN _vgr=10
IF vgrf=7 THEN _vgr=20
RETURN
! % Dialog Modus %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialog3:
r01$="Vollsimulation"
r02$="Simulation"
r03$="Echtzeit"
r04$="Entfernung:"+aed$
r05$="i Information"
ARRAY.LOAD sel3$[],r03$,r02$,r01$,r04$,r05$
DIALOG.SELECT sel3, sel3$[],"Modus:"
IF sel3=1
 INPUT"Zeitrafferfaktor ve[0,1]=…",vse,0.05:s07=1
 vse=vse+1
 IF vse<=1 THEN vse=1.001
 IF vse>2 THEN vse=2
ENDIF
IF sel3=2: INPUT"Beschleunigungsfaktor vsmn[-1,1]=…",vsmn,0.1
 IF ABS(vsmn)>1 THEN vsmn=1
v=0.1:s07=-1:ENDIF
IF sel3=3
 INPUT"Minimaldistanz in AE=…",vsm_mn,0.02
 IF vsm_mn<0.01 THEN vsm_mn=0.01
 IF vsm_mn>100000 THEN vsm_mn=100000
 INPUT"Maximaldistanz in pc=…",vsm_mx,2.5*10^8
 IF vsm_mx<1 THEN vsm_mx=1
 IF vsm_mx>14.25*10^9 THEN vsm_mx=14.25*10^9
 INPUT"Zeitrafferfaktor vs[0,1]=…",vsm,0.05:s07=0
 vsm=vsm+1
 IF vsm<=1 THEN vsm=1.001
 IF vsm>2 THEN vsm=2
ENDIF
IF sel3=4                  %in AE
 ARRAY.LOAD selae0$[],"Astronomische Einheit AE","Lichtjahr Lj","Parsec pc"
 DIALOG.SELECT         selae0,         selae0$[],"Anfangsentfernung,         Einheit
[Lj="+INT$(Lj_)+"AE|pc="+INT$(pc_)+"AE]:"
 IF selae0=1:INPUT"Anfangsentfernung AE0=…",aed,1
  IF aed>14.25*10^9*pc_ THEN aed=14.25*10^9*pc_
 ENDIF
 IF selae0=2:INPUT"Anfangsentfernung Lj0=…",aed,1
  IF aed>14.25*3.26*10^9 THEN aed=14.25*3.26*10^9
 aed=aed*Lj_:ENDIF
 IF selae0=3:INPUT"Anfangsentfernung pc0=…",aed,1
  IF aed>14.25*10^9 THEN aed=14.25*10^9
  aed=aed*pc_
 ENDIF
 IF aed<=0 THEN aed=1
 ed=(sx/2.9)/aed          %Anfangsentfernungsfaktor ed
 GOSUB anfangsentfernung
ENDIF
IF sel3=5
 GOSUB dialoginf:GOTO st0
ENDIF
IF s07<>1 THEN ur$=""
RETURN
anfangsentfernung:
IF aed<Lj_:aed$=FORMAT$("#####.##",aed)+" AE":ENDIF
IF aed>=Lj_
 Ljd=aed/Lj_
 IF Ljd<=pcl_:aed$=FORMAT$("#.##",Ljd)+" Lj":ENDIF
 IF Ljd>pcl_
  IF Ljd < pcl_*10^3
  aed$= FORMAT$("###.##",Ljd/pcl_)+"pc":ENDIF
  IF Ljd >= pcl_*10^3 & Ljd< pcl_*10^6
  aed$= FORMAT$("###.##",Ljd/(pcl_*10^3))+" kpc":ENDIF
  IF Ljd >= pcl_*10^6 & Ljd< pcl_*10^9
  aed$= FORMAT$("###.##",Ljd/(pcl_*10^6))+" Mpc":ENDIF
  IF Ljd >= pcl_*10^9
  aed$= FORMAT$("###.##",Ljd/(pcl_*10^9))+" Gpc":ENDIF
 ENDIF
ENDIF
RETURN
```

```
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialoginf:
GR.ORIENTATION 1
GR.SCREEN sx,sy           % Bildschirmformat
mx=sx/2:my=sy/2
GR.SET.STROKE 2
ARRAY.LOAD selinf$[],"i Astronomische Parameter","i Sonnensystem Parameter","i Stern Größenvergleich","i Rotationen im inneren Sonnensystem","i Rotationen im äußeren Sonnensystem","i Sonne-Mond-Erde Distanz","i Zehnerpotenzen"
DIALOG.SELECT selinf, selinf$[],"i Information:"
GOSUB global
IF selinf=1:INCLUDE ssr_parameter1.bas:ENDIF
IF selinf=2:INCLUDE ssr_systemgr.bas  :ENDIF
IF selinf=3:INCLUDE ssr_sterngr.bas   :ENDIF
IF selinf=4:INCLUDE ssr_rotat1.bas    :ENDIF
IF selinf=5:INCLUDE ssr_rotat2.bas    :ENDIF
IF selinf=6:INCLUDE ssr_distanz.bas   :ENDIF
IF selinf=7:INCLUDE ssr_potenz.bas    :ENDIF
GR.ORIENTATION -1
GR.SCREEN sx,sy           % Bildschirmformat
mx=sx/2:my=sy/2
RETURN
! % Dialog Uhrzeit, Kalender %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialogu:
x01$="Ja"
x02$="Nein"
ARRAY.LOAD sel4$[],x01$,x02$
DIALOG.SELECT sel4, sel4$[],"Uhrzeit und Kalenderskala:"
IF sel4=1:swu=1:ur$=_ur$:ENDIF
IF sel4=2:swu=-1:ur$="":ENDIF
RETURN
! % Dialog Kompass %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
dialogk:
k01$="Kompass"
k02$="Position"
k03$="Kompass und Position"
ARRAY.LOAD sel5$[],k01$,k02$,k03$
DIALOG.SELECT sel5, sel5$[],"Kompassoptionen:"
IF sel5=1:swk=1:kp$=_kp1$:ENDIF
IF sel5=2:swk=-1:kp$=_kp2$:ENDIF
IF sel5=3:swk=0:kp$=_kp3$:ENDIF
RETURN
source_:
GR.TEXT.SIZE txzi/2
GR.TEXT.ALIGN 3
GR.TEXT.DRAW tx,sx,40,"IAU[2023]"
GR.TEXT.ALIGN 1
GR.TEXT.SIZE txzi
RETURN
sourceg1:
GR.TEXT.SIZE txzi/2
GR.TEXT.ALIGN 3
GR.TEXT.DRAW tx,sx,40,"NASA["+_g1_mon$+"/"+_g1_jar$+"]"
GR.TEXT.ALIGN 1
GR.TEXT.SIZE txzi
RETURN
sourceg2:
GR.TEXT.SIZE txzi/2
GR.TEXT.ALIGN 3
GR.TEXT.DRAW tx,sx,40,"CDS["+_g2_mon$+"/"+_g2_jar$+"]"
GR.TEXT.ALIGN 1
GR.TEXT.SIZE txzi
RETURN
! % Einstellungen Ende %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fin::INCLUDE ssr_fin.bas:RETURN
! % ENDE %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

! %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

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